The Builder.

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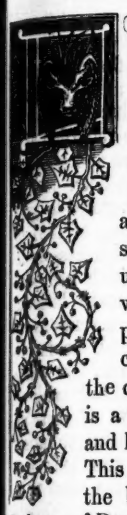


LOCKS and safes have been treated of in a large book by Mr. Price, now before us.* The most ancient lock ever seen in modern times was that described by Mr. Bonomi, as having secured the gate of an apartment in one of the Khorsabad palaces. Like those still used in the East, this lock was a wooden one, with a key so large, probably, as to require to be carried on the shoulder. Indeed, the carrying of keys on the shoulder is a practice which is still adopted, and has long prevailed, in the East. This practice is thus alluded to in the book of Isaiah: "The key of the house of David will I lay upon his shoulder." Primitive as such a key may very naturally be regarded in these times of lock-picking, lock controversies, and lock improvements, the ancient and modern lock of Egypt and other parts of the East is by no means a despicable invention; indeed, it is a remarkable circumstance that some of our most celebrated modern locks are but an elaboration of the principle of the Egyptian lock, which is an invention of a superior order altogether in comparison with the warded lock of modern times, so far as real security is concerned. The bolt or bar of this lock when shot is fixed in its position by a set of pins or slides, which require to be lifted by the proper key with corresponding pins, in order to enable the key to shoot back the bolt. Doubtless our skilful modern lock-pickers could manage to pick such a lock, just as they have picked the lock of Bramah, which is, in fact, essentially Egyptian in principle; but, for all that, it is a very notable circumstance that one of the most celebrated and approved of modern locks is but a modification of so ancient and primitive an invention. We have frequently pointed attention, however, to the fact that in many very ancient inventions we seem rather to have the effete or worn-out remains of a still more ancient and a still more advanced state of science or art than the mere germ or primitive form of such inventions. So does it seem to be in the present instance. Were we able to trace the progress of such a principle as this of Bramah's lock, through such modifications as those of Mordan and Cotterill, onwards to its culminating point of perfection, and beyond that still through an era of deterioration and decay, in the extreme lapse of ages, we should expect to find it at length assume just such a *vestigial* shape as that of the Egyptian lock,—essentially the principle, but stripped of all elaboration, and of all other trace of high art advancement than that implied essentially in the very existence of the principle, as one in itself involving evidence of some previous state of high art development of which it was but the worn-out vestige. But is it not a circumstance still more notable than that displayed by the ancient wooden locks of Egypt and Assyria, that there is a *Chinese wooden* lock, of very superior character to the Egyptian, and, as Mr. Denison remarks, "exactly similar in principle to the long celebrated Bramah lock, inasmuch as it requires *a number of independent sliders to be pushed in to different depths* before the lock can be opened."

This very interesting and remarkable lock, Mr. Denison says, was shown to him by Mr. Chubb, to whom it had been given by a gentleman who brought it lately from China. He did not know "how many years, *or thousands of years*, the invention had existed there, but probably," he adds, "long before Bramah's time, just as the recent invention here of that very neat and useful instrument, the spiral or corkscrew drill, was found to have been anticipated long ago in India." That this Chinese "Bramah" must be an invention of extreme antiquity, the stagnation of art and science for ages in China would seem to indicate; if, as is probable, it existed at all in China previous to Bramah's time; and this is but one of scores of instances of a like order, in which the most modern and advanced, and apparently novel and original, inventions have been found to have been anticipated for ages amongst that wonderful people, the Chinese. As for the kindred Egyptian lock, it may here be noted that the figure of such a lock, sculptured among the basso-relievos of the great temple of Karnac, proves it to have been in use in Egypt for above 4,000 years, during which period it does not appear to have undergone any appreciable change. The same sort of wooden pin-lock, we may also remark, has for centuries been in use in the Faröe Isles; and it is said that a lock similar in character has been in use from time immemorial in Cornwall, introduced thither, doubtless, from Phœnicia, by the tin traders of ancient times. Another Eastern lock had a key formed like a large sickle, and also worn on the shoulder, as the sickle itself is to this day by reapers in some parts of this country.

The earliest known English locks were the warded ones, and these are still the commonest of locks in this country, although, as respects security, they are of a very low order, and have long been superseded, for more important purposes, by locks of quite another principle. The keys of the old warded locks, however, were often very elaborate and beautiful art-works, as is proved by the fine examples of Early English keys now in the Museum at Brompton. The locks themselves comprise, besides the bolt and key pipe, a series of fixed or stationary obstacles, which are the wards, or wheels, in and about the key-hole, or between the key-hole and the bolt, and round which the key, with its correspondent slits, is turned, while any other instrument was supposed to be prevented by the wards from doing so; but in reality, a bunch of skeleton keys is but too likely to possess some one or more capable of giving the slip to the most cunningly-devised wards, and of turning the bolt as if there were no such obstacles in the way to it; and even failing such a contingency, it has always been open to the lock-picker to take an impression of the wards in wax, or smoke them out of their secret otherwise, and so to make a key that will fit the lock precisely "as if it were made for it." Warded locks, therefore, are much more suitable to keep out the prying eye of mere curiosity than the light-fingered hand of the thief who seriously sets about the task of lock-picking. To the class of warded locks belongs the common padlock. There is a species of padlock, however, of a very different description, namely, the puzzle or letter lock, which, though of a far superior order, as regards security, to the warded padlock, is in fact one of the oldest locks in use in Europe. Not only so, but there is a curious affinity, which we have not seen adverted to, between its principle and that of the Bramah lock, which, as already noted, is in principle akin to the most ancient of all known locks. The puzzle lock usually consists of rings strung on a barrel enclosing a spindle, with studs corresponding with grooves in the barrel, on which the rings can be set to different letters or figures engraved on them, so as to produce a word or sum which will be the "open Sesame," by means of which the spindle studs are enabled to slip along the grooves, and so alone to open the padlock. One of these puzzle locks belonging to the first Napoleon remained in this country from 1815 to 1856 unopened, notwithstanding reiterated attempts to do so, but in 1856 it was at length opened by Mr. C. Aubin, who discovered the combination of figures to which it was set.

The puzzle lock has been regarded as involving one of three distinct principles of lock construction; but its analogy to the Bramah principle, which admittedly belongs to another of the three alleged principles, tends to resolve the three into only two distinct principles. One of these is the ward; the other (in the words of Mr. Price) "consists in the insertion of such impediments to the retraction of the bolt as are not fixed or stationary like the wheels or wards, but moveable, and of various combinations, and which prevent other instruments than the true key from opening the lock." To this class belong all the locks which have been invented, from the first of Barron's, the patent for which was enrolled in 1778, downwards to the present year. To this class also belong the ancient Egyptian, Assyrian, and Chinese locks already referred to. Barron was the first to improve on this ancient principle, by the introduction of his double-acting tumblers. Most of this latter class are called either tumbler or lever locks. The two principles,—fixed or stationary wards, and moveable wards or tumblers,—are applied in combination as well as separately. To the warded lock the single tumbler was first of all added, this tumbler being merely a lever with a tooth or square pin in it, which drops into a notch in the bolt, so that the bolt cannot be moved until the pin is lifted out of the notch. In this, however, there is but little additional security beyond that of the common warded lock, as any kind of pick or false key that will clear the wards will readily raise the tumbler. The requirement of raising the tumbler to a certain height only, and neither higher nor lower, to let the bolt pass, introduced a new element of security; and this was managed very simply by putting the square pin in the bolt in place of in the tumbler, and by making a gating and two wider holes or chambers in the tumbler (more or less like the letter H as a whole), the gating just the width of the bolt-pin or *stump*, as it is called, and the wider holes intended, the one for the stump when the lock was bolted, and the other for it when the lock was unbolted. Thus, unless the tumbler were lifted exactly to such a height by the key, or its counterfeit, that the gating was exactly opposite to the stump, and neither higher nor lower, the stump could not pass from one of the wide holes or chambers, through the gating, into the other chamber, and thus the lock once bolted would so remain till this was done. But *pressure* applied to the bolt by a wire through the key-hole while the tumbler was gradually lifted by another wire or picklock might effect the purpose: nevertheless, the gated tumbler was a decided improvement on the mere drop tumbler. The next advance was Barron's multiplication of the tumblers, since adopted in all lever locks with any pretensions to security. Several levers or tumblers now required to be raised each to a particular height of its own, so that the gatings of all would coincide, and thus allow the stump to pass from the one chamber to the other. This is the principle of the Chubb lock, although, superadded to this principle, there is the detector, the great and peculiar feature in Chubb's lock, and to which it had mainly owed its celebrity. This detector is merely an additional lever, which lies over the tumblers, and locks fast into the bolt if any of them are lifted too high, and it can only be set free by overlocking the bolt a little with the

* Treatise on Fire and Thief Proof Depositories, and Locks and Keys. By George Price. London: Simpkin, Marshall, and Co. Stationers'-hall court. 1856.

Lecture on Locks, by Mr. E. B. Denison, reported in *Doncaster Gazette*, 2nd January, 1857.

true key. Price is of opinion that the detector springs are of positive advantage to the lock-picker.

Security being added to security in course of successive steps of progress, it was till lately imagined that all these many-tumblered locks were impregnable, the difficulty of raising all the tumblers or levers so as precisely to open the gating being regarded as unsurmountable, and the bellies or lower edges of the tumblers giving no clue by means of wax impressions or smoked blank keys to indicate how high each required to be lifted. The idea that pressure could be so applied to the bolt through the key-hole, while the levers were being successively lifted, that the gatings of all could be made to coincide, seems almost never to have occurred to any one in connection with the picking of lever locks till it was announced in the Society of Arts in 1851 that this had actually been done in America; and shortly afterwards Mr. Hobbs came to London as an exhibitor at the Crystal Palace, and began picking the *crack* locks of English makers right and left, till at length his own "Protector" lock was picked by an Englishman, one of Mr. Chubb's workmen, named Goater, who, however, in attempting to pick an English lock of a new construction, invented by Mr. Parnell to meet and obviate the startling disclosures then being made, found it *necessary* to resort to practices reprobated not only by public opinion, but by judge and jury, to whom the circumstances were referred, and who decided hollow against Mr. Goater and his plea of having *fairly* picked Mr. Parnell's lock; indeed, it was shown that he had surreptitiously got possession of the lock, and tampered with it, so as to enable him to make a duplicate of its proper key, with which, of course, it was as easy to open the lock as with key No. 1.

These and other important proceedings, under the general name of "the lock controversy," led to great improvements in the construction of locks. But, first of all, Mr. Hobbs succeeded in picking both Bramah's lock and Chubb's, as well as others. And here it may not be amiss more particularly, to explain the construction of Bramah's lock, so far as that is possible without diagrams or drawings. The principle of it, as Mr. Denison lately remarked in his interesting lecture on locks,—

"Consists in a number of slides having to be pushed in to different depths by the key, which has slits of different lengths in it, and is resisted by a spring which pushes up the slides. These slides are set in a cylinder or barrel, which turns with the key, and can only turn when the notches in the slides are all brought into the same plane as a steel plate which surrounds the cylinder and has corresponding notches in it. This lock was pronounced by the inventor absolutely unpickable; but it was, nevertheless, picked within a few years, and, strangely enough, by a method identical with that used by Mr. Hobbs in 1851, when he gained the 200 guineas for picking the challenge-lock which had hung for years in Messrs. Bramah's window in London. It was supposed until then that the addition of what are called false notches had prevented that mode of picking; but Mr. Hobbs showed that to be a mistake."

And, finally, by way of proving whether Messrs. Bramah's present locks are easier or harder to open, Mr. Denison added, that he had lately seen Mr. Hobbs open one of their best and newest large locks in three minutes and a half! Mr. Chubb had also shown him a very neat little instrument which a man can carry in his waistcoat pocket, and by which anybody who gets hold of a Bramah key for half a minute may take an exact copy of it without your even seeing what he is doing.

Nevertheless, there is great scientific beauty as well as symmetry in the principle of Bramah's lock. That of Mr. Cotterill is very analogous, only the slides in this case radiate from the keyhole, as a centre, instead of lifting cylindrically. Mr. Hobbs, we may add, expended several hours in a vain attempt to pick one of Cotterill's locks. In allusion to this last and other locks, Mr. Denison says,—

"Cotterill's lock is a modern one substantially on the principle of Bramah's, only with the sliders pushed out radially by the key acting as a wedge. The consequence is that, whether that lock is secure or not, the enormous thickness required for the key in order to get a moderate range for the sliders will be a fatal obstacle to its coming into general use. The action of pushing in the wedge-shaped key against the friction of the sliders is also unpleasant. It is remarkable that though the insecurity of the Bramah lock, without false notches, was known and published so long ago, it never occurred to anybody in England that Chubb's and all the other many-tumblered locks could be opened in the same way, and they were never made with false notches in the tumblers and stump until after Mr. Hobbs's exposure of them in 1851. Nay, when it was stated some years before at the Institution of Civil Engineers that the Chubb lock was not regarded safe in America, and could be picked easily by this tentative method, as it is called, nobody would believe it. All the best tumbler locks are now made with false notches, and there is no doubt that they do add very considerably to the difficulty of picking by any but first-rate hands."

The tentative method of picking, alluded to by Mr. Denison, and which has lately acquired such celebrity, though actually published in the "Encyclopædia Britannica," nearly thirty years ago, consists merely in applying some pressure to the barrel of a Bramah lock or the bolt of a Chubb or other tumbler lock, which would make it open if the sliders or tumblers were all free; and then the sliders or tumblers are moved gently, one by one, never moving any except those against which some pressure is felt, and at last they are all got into the position in which the notches or gatings will allow the barrel or the bolt to move, and the lock then opens of itself. *False notches* are notches shorter than the real ones, made in the sliders and the plate which surrounds them, and so when a slider is pushed down as far as a false notch, it allows the barrel to move a little, but no more; and for many years it was supposed to be impossible to feel whether a slider was at a false notch or a true one. But Mr. Hobbs showed that that made no real difference; for whenever the lock cannot open it must be because there is a pressure upon some one or more of the sliders, and that pressure can be felt by gently moving or *tickling* them, and so one knows if it is in a false notch, and has only to work on till he gets it into a true one.

Some recent locks are very complicated; such as the parautoptic lock of Messrs. Day and Newell, of New York: with this twenty-guinea changeable-keyed-lock Mr. Hobbs's name has been associated. Messrs. Day and Newell's lock, however, was also picked, and by a mere wooden key, and Mr. Hobbs had to add a kind of wiper to its revolving curtain, in order to frustrate the mode adopted of picking it, with what result we do not know.

The year 1851 was a grand turning point in lock construction. So much so, indeed, was this the case, that all locks invented previous to that year have been regarded as old locks, and only those since invented as the new order of locks. Of these latter, however, there are not many, besides the improved Chubb, Bramah, Hobbs, and other locks. But though not numerous, as Mr. Price remarks, they are "effective, to the purpose," and decidedly "good locks." In his preface, he remarks that, except in his own work now published, "the improved locks, which were the fruit of the 'lock controversy' produced by the Great Exhibition of 1851, have not been described, with two or three exceptions, although many of them are far superior in security to nearly the whole of the locks known prior to the year 1851." It was, therefore, to be expected that any one of these new locks which had in any way become distinguished, would be found described in Mr. Price's portly and rather diffuse volume of more than 900 pages. One of these very locks (patented in February, 1856) has just been selected by the authorities acting on behalf of the Board of Trade Department of Science and Art, as the most suitable for the new Museum at Brompton, and we naturally turned to Mr. Price's pages, in order to enable us to give our readers some account of a lock selected for such a purpose; but to our disappointment we find there not a word on the subject, although the patent is included in the list of those to which, as a class, Mr. Price refers in the favourable terms just quoted. We have therefore been at some trouble to obtain a few particulars as to this lock, and to study its peculiarities a little, so as to enable us to give some account of it. The patentee is Mr. Parnell, to whose two previous inventions of a similar kind since 1851 (and which two he has since sold to his former partner, Mr. Puckridge), Mr. Price devotes considerable space, as well as to the notorious case of Goater, to which we have already alluded. The lock selected by the Board of Trade officials, however, is a third and still more recent invention than these, and is named "the universal lock," the patentee having aimed at such simplicity in construction and lowness in price, combined with new and effective modes of security, as would entitle it to be regarded as a lock for general and not for mere special uses. Mr. Parnell is known to have been in the van of those inventors who endeavoured to give that security which the controversy of 1851 so clearly proved to be desirable and necessary to restore the public confidence, which had been so sadly shaken in the use of locks hitherto deemed secure. The two first inventions of this patentee doubtless contributed, so far, to remove the feelings of insecurity and fear which the controversy had engendered; but, with all due acknowledgment to the merits of these inventions, something more was wanting to satisfy the most scrupulous; and the new lock just selected by the Board of Trade does seem to be capable of fulfilling its purposes, so as to obviate all idea of insecurity, at least till some new mode of lock-picking shall be discovered besides that by *pressure* on the bolt, with which so many wonders have been accomplished. The invention, in fact, was expressly devised in order to obviate the possibility of its being assailable by pressure on Hobbs's scientific and celebrated principle of lock-picking. The lock appears to be so constructed that pressure obtained against the bolt, without the proper key, entirely *stops the action of the levers*, an end accomplished by giving the lock or bolt two actions, namely, a forward and a backward one in the simple act of locking or unlocking. This is done by a single revolution of the key as in locking any ordinary lock. The levers are adjusted twice by a simple mechanism ere the lock can be unlocked; and this must be done in the first place before any pressure is applied. The stump of the bolt is original and peculiar, and is propelled into a special or third chamber, formed in the levers, and which the stump enters in locking: this is effected by the back action already mentioned. To make this important feature clear, we may add, that after the bolt of the lock is shot out, and held there by the levers, *the bolt*, in the further revolution of the key, *recedes*, and *locks down* the levers; thus entirely frustrating the *modus operandi* of the scientific and experienced lock-picker, as also does the safeguard of a shield supported upon a high circular ward, upon which it revolves; also revolving in the cap-plate of the lock; which entirely closes the key-hole during the operation of locking or unlocking. This shield being connected, by a stump, or notch, with the lever, *must* be turned; thus shutting out the lock-picker even from attempting to raise the locked levers.

Mr. Price's book, although its leading title relates to fire and thief proof safes, mainly treats of locks and keys, inasmuch as only the first 170 of its 900 pages relate to safes, with which, as a tradesman, he appears to be personally more interested than with locks.

In the outset the author enters upon a brief history of iron safes and chests, which are of quite a modern date, having had their origin within the present century. "Our forefathers," he observes, "in the simplicity of their arrangements and requirements, were satisfied to place their valuables in an oak chest, secured by one or more locks in front, or in a brick or stone closet, with either a wood door studded with nails, or a plain iron one; in either case secured by a common warded lock, or a lock without any wards at all, or with the usual iron bands with hasps and staples and padlocks." These simple contrivances, however, were effective, for in those days robbers were less adroit than now, and Mr. Price adds that "the oak chest was quite as safe as the iron one now, because the strength of the chest itself would generally resist violence, while a lock of the most simple construction afforded sufficient security, from

the circumstance that at that early period the means of picking such locks were not understood." Descriptions are afterwards given of the various patents taken out for the manufacture of iron safes, and of Mr. Price's improvements upon them, for the nature of which we must refer our readers to the work itself. Among the other topics discussed are the requirements in an iron safe to make it secure against thieves and fire; the construction of those in general use; the two principles on which safes are made fireproof; the preservation of parchment deeds from destruction by steam and damage by water; fireproof closets and strong-rooms; the best places for fireproof safes to occupy; powder-proof locks; and the comparative prices of wrought-iron fire-resisting and thief-proof safes;—on all of which much useful information is given, although some of it doubtless must be taken *cum grano salis*, since one cannot close his eyes to the fact that in this practical treatise, by a practical man, there is not a little of the nature of advertisement involved. Nevertheless, Mr. Price's "little work," as he rather oddly calls this bulky volume, contains a large amount of interesting matter on the subjects regarding which he writes, and the whole is fully illustrated by engravings of locks, keys, and safes.

With one observation of practical application we close our remarks. The majority of the locks used in our ordinary dwelling-houses are of the most trumpery description, being usually out of order within the first six months. A good serviceable lock at a moderate price is much wanted; but, beyond that, there must be a determination on the part of buyers of houses, and occupiers, not to put up with such locks as are now too often used, and which prove a constant annoyance and cause of expense.

THE MEMORIAL CHURCH AT CONSTANTINOPLE.

WE have already announced that forty-six designs were thrown in by architects, in this one of the lotteries, or *little-goes*, which are offered to aspiring talent. The "prizes"—as they are called in phraseology revived from days of other lotteries—were drawn, as our readers know, by Messrs. W. Burges, G. E. Street, and G. S. Bodley, and it was recommended that an "extra prize" of 35*l.* should be presented to Mr. W. Slater. The other designs have not yet been exhibited.*—Such grounds of objection as we have to architects' competitions in the aspect in which they are just now being presented to us, belong less to the question of the intended good faith of adjudicators—concerning which we have here no doubt—than to the question whether the sort of decision calculated upon by competitors, can be expected,—whether chance, or showy drawings, or anything rather than design and constructive skill, has not more to do with a selection than actual merits,—and whether, in short, gain which there may be to some competitors—styled, as it happens, *successful* or *unsuccessful*—includes any of a pecuniary nature. If on the evidence of such cases as the present, it appear that adjudication can be made according to merits, or if any adequate object, such as mutual improvement, is served by the system, architectural competition may be defended; but if it affords, in the majority of cases, none of these advantages, it becomes precisely that which it is often designated, mere gambling, and as such, a vice delusive and injurious to those who are possessed by it.

That the tendency is now towards delusion and unfairness, we tried to show in our recent remarks on what are called "Instructions." The giving anything more than *suggestions*, is for the committee, or adjudicators, to tie their own hands; and after having placed a limit upon freedom of design, is almost invariably the forerunner of some injustice.

The judges in the case of the Memorial Church, possibly have chosen designs, one of which may be the best for the purpose; or they may have rewarded such as were the best of those submitted; but they have certainly rewarded designs which were inconsistent with their "instructions." These were by no means perspicuously worded. The style to be adopted was "a modification to suit the climate, of the recognized ecclesiastical architecture of Western Europe, known as the 'Pointed' or 'Gothic;'" and it was added, "the neglect on the part of any architect of this provision will absolutely exclude from competition;" and further (though after a reference to "the numerous and beautiful instances existing in Southern Europe of this modification of Pointed architecture," as amply justifying "the preference thus given to it"), it is stated,—"Any approximation to the specific features of Byzantine architecture is prohibited, as being objectionable in many respects;" and,—"Still more must the competitors abstain from the imitation of any forms connected with the religious architecture of the Mahometans," which, as it is correctly said, is "at Constantinople based upon Byzantine models," and which indeed everywhere, was an offshoot from the same style. Lest these and other stipulations might not be sufficiently clear, it was added,—"Non-compliance with the above regulations will absolutely exclude from the competition."

Now we apprehend that from these words there follows some little inconsistency. The examples of the Italian Gothic exclude, indeed, much of the Greek symbolic sculpture and decoration; but they are Byzantine in some of their chief features—Byzantine from the influence of the Greek art as transplanted through Venice and Ravenna, and Byzantine-Saracenic from the influence which likewise spread from the south. The surprising development of late Greek art, even to the remote borders of Europe, is a subject which deserves the particular attention of every architectural student.

Therefore, the "instructions" of the committee were contradictory,—or at least, we should say, were calculated to *embarrass* the architects who had to prepare designs;—as similar interference with the logical process which is that of all *design*, must inevitably do. The judges in the present case have rejected, perhaps with reason, designs which introduced "forms which too much resemble those of Byzantine or Greek architecture;" but they have awarded their chief premiums to designs which every one at first sight pronounces to be Byzantine. Thus the design to which they have given the second place,—looking at their "instructions," is that which might have been expected to stand first. Compared with the design which is first, and with that by Mr. Slater, it makes limited use of coloured materials externally. The tendency of the "instructions" was obviously to interdict the use of coloured materials in horizontal bands, to the extent to which they are applied by Messrs. Burges and Slater. The horizontal bands are a feature most marked in the Saracenic styles. That they are emphatically a Mahometan feature, will appear to those who inquire into their origin. The rich dresses of the Arabians, and the manufactures of Damascus, were so greatly influential in the forms and colours of architectural detail, that no student can acquire a proper knowledge of the Eastern styles, without taking them into consideration; and Professor Semper, if we remember rightly, traces all such polychromatic architecture as that which prevails both in the mosques of Cairo and the Christian churches of Italy, to the hangings of coloured drapery used by the nomadic races, of which so large a number became Mahometans.

There are particular symbolic forms and sculpturesque details in Byzantine works which certainly should find no place in a Protestant church,—though we are not sure that some of them have not been adopted in English edifices. But there are other details, equally Byzantine or Mahometan in their origin, which there was no intention to exclude in the present case, and which lend themselves most advantageously to architecture where colour in materials is used. So much, then, for the tendency of an attempt to bind and trammel the expression of design by needless mandatory "instructions."

A considerable excess in external colour, over what we would consider to be satisfactory in England, is rightly enough introduced in a building at Constantinople. The climate is supposed to favour it: and the adjacent buildings; costume in the crowded streets still retaining much of its former party-coloured appearance; and the whole character of the scene, establish a different key-note of colour to that which we hold might be satisfactory with us at home. That these differences of chromatic scale exist, will be obvious to any one who has noticed the changes produced upon himself in passing from place to place, by the local materials, even in England.

The party-colouring, therefore, which gives the main character to Mr. Burges's design, although it may be in excess, is not so much so as might at first be supposed. In Mr. Slater's design the effect is injured by the execution of the drawing.

The church of St. Andrea at Vercelli, on which the designs placed first and third are regarded as founded, is certainly a very good example of the development of the Italian Tre-cento architecture,—where some of the essential Byzantine elements of the earlier styles were excluded and is one which well deserved to be studied. What precise use has been made of it, in the absence of the memoirs, to which the judges refer as accompanying the designs, we are not aware of,—but the designs are obviously much varied from the supposed model.*

Competitors may do themselves real injustice by an attempt to fortify their case by quoting a precedent. It is the misfortune of the present system, that judges being afraid to go wrong, are still sometimes influenced by a named example: designs, therefore, are submitted by architects, on a basis even inconsistent with genuine art, and the proper use of precedent. Something which is of most value is sacrificed, and a lower level is sought as acceptable to the men in authority.

Mr. Burges's design has, indeed, as the most prominent feature in its plan, a *semi-circular* apse, springing directly from the intersection of the transepts, with an ambulatory carried round, suitable for monuments. The open pier arches to this ambulatory from the choir proper, evidently owe more to the study of Beauvais Cathedral than another building. The general plan has nave and aisles, and transepts, and a detached campanile, placed askew with the south front. There is a groined stone-ceiling and timber-framed roof, of low pitch, covered with red tiles. Flying buttresses, it is to be observed, spring mainly from the roof covering, instead of from a base of greater apparent sufficiency. The west front has a rose-window, and three deeply recessed doors. To the latter there is a broad pent-house roof, covered with tiles. The piers and arches on each side of the nave, are coupled; that is to say, the bay between the external buttresses occupies the width of two arched spaces internally, the main ribs of the groining being arranged accordingly. Iron ties are introduced, as in many of the Italian buildings,—with doubtful advantage in point of taste. In the exterior, as we have intimated, colour in bands and patterns, plays an important part in the design.

Mr. Street's design has few, if any, Italian features. It is a cross church, without aisles; but in their place, along the nave, there is a cloister, with which the projection of the buttresses resisting the thrust of a stone groined ceiling (said to be nearly equal in span to that of King's College Chapel, Cambridge), corresponds; and the same cloister continues along the west front. Thus the church is lighted altogether from windows in the upper part. These generally are grouped in three narrow lights, with externally, arches, — coupled so that there is a central shaft—and, further, a bold arch, from buttress to buttress, forming a deep shadow. The depth of the windows allows of the intro-

* With reference to the design marked, "In Te Domine Speravi," given in the list of those especially mentioned (see p. 81. *ante*), without the architect's name, we are asked to say that it was by Mr. William White.

* In a note to us Mr. Bodley says, on this matter:—"Will you allow me to state that, as far as I am aware, the only point of resemblance between my design and the church of S. Andrea, at Vercelli, is in both having a *square* east end. My reason for adopting this especially *English* feature was the idea that, as a 'memorial' church, the building should bear evidence of its history, and I remarked, in my report, that when in the Middle Ages a church was built at Vercelli under English influence, and therefore under similar circumstances to the proposed church at Constantinople, the square east end was adopted. I do not think there was any other point of resemblance whatever. The church at Vercelli, indeed, is a large cross church, with apsidal chapels, and altogether of a scale and character distinct from the proposed church, and for which the prescribed estimate would have been inadequate."

duction of an external passage-way round the nave. There is a good moulded cornice, with which the weatherings of the buttresses are conjoined by the introduction of an elegant foliated enrichment. At the east end is an octagonal apse, with long windows, the groining internally being partly supported by the shafts of the inner order of tracery. The building has two octagonal turrets, one on each side the intersection of the cross. The design is put forth as for a memorial chapel rather than a church. Parts may be found which resemble continental models; but there is great merit of design in this production. In the internal details, more colour is introduced; and some of the fittings, as might be expected, display much care and taste.

Mr. Bodley's design had made a less marked impression upon us, during the short time we had for examining it at first, than it has since done. Perhaps justice is not done to it in the drawings. It is, as will have been already inferred, Italian Gothic; and the chief study seems to have been given to the interior, which is rightly praised by the judges, who also say that the design is "remarkable for great simplicity of plan." It has a tower at one angle of the building, with a high-pitched roof; and generally has the plan of an ordinary church, with the addition of a long *narthex* or porch at the west. A waggon-headed vault, of timber, with principal arches of stone, covers the central division,—similar construction being adopted in the aisles, which are without windows. The principal arches are stilted, in the manner more frequent in Sicily than the north. The decorative character is expressed mainly through surface decoration.

Mr. Slater's design has the regular cruciform plan, two western towers, with tiled roofs, is in manner approximating to Early English, and has many of the details of the masonry and ornament of very good character. Its chief external effect is derived from its bands of coloured masonry, and tiling to the roofs and spire cappings, and the boldness of its flying buttresses. The wall buttress, we may observe, in this design, and that first on the list, appears to be studiously made of very slight projection externally. One feature which is attempted in this design, it is singular has not been introduced in any other of the instances before us. We refer to the true stone roof, so appropriate to the climate, and so often found in Eastern buildings. Mr. Slater, however, we rather think, has not applied the principle in the best form. His roof—of low pitch—both in the case of nave and its aisles, is formed of blocks of stone, which in the aisles might exert considerable thrust upon the walls in the bays, where unresisted by buttresses. The better system would, we think, have been to use thinner slabs—though joggled together in much the same good fashion as the blocks—bedded upon a considerable thickness of pumice-stone, or other material of the lightest description. The vaulting is all waggon-headed, the diagonal ribs and others being planted on the surface; and we believe this arrangement—simulating the other where the diagonal of forces is directed to the position of the buttress—and where the latter has a distinctive use in Gothic architecture—was held by the judges to lessen the merit of the design. The design, however, appears to us deserving of study.

Altogether, even with the limited opportunity for examination which has been afforded, we may pronounce the designs as marked by much beauty of effect, although, as must necessarily happen, each one of the competitors may derive something from the observation, of which now he has the chance, of what is done by others. Of the justice of the selection, it would be necessary for us to see the other designs before speaking; but we have already said something of the difficulties which committees make for themselves in addition to those which are inevitable.

The successful designs were exhibited at a *conversazione*, at the rooms of the Society for the Propagation of the Gospel in Foreign Parts, on the 13th inst. when Professor Willis delivered an address, chiefly descriptive of those designs, and supplying not many particulars of the competition beyond what we had previously gathered,—as we have noted them above. He began by stating the character of the problem which had required working out,—namely, to design a building suitable to congregational purposes and public worship, yet suitable for a memorial, and for the reception of monuments. Towards the attainment of the object, the committee had determined upon a competition. Architectural competitions were not new things; and, as he said, had led to the best results,—as in the case of Canterbury Cathedral, when a foreign architect brought over ideas which were new to England. By such fresh elements applied with local materials and details from the hands of the native workmen, new combinations were formed, and steps of progress were the result. In similar manner constantly, features of architecture were transplanted,—by mediæval architects—who as priests had no particular nationality. Lincoln Cathedral, and its points of resemblance to the Burgundian churches, afforded illustration of this sort of influence. The present project would lead to results of the like character. He then referred to the church at Vercelli, adopted as a study by two of the successful competitors, and which had been erected, as it was said, by English workmen and English money, or, at all events, for one who had lived in England, where he held as a benefice the priory of St. Andrew, at Chester.

In considering the style for the new church, the professor said it was thought desirable to allow of no features which were Byzantine, or which were derived from the Byzantine, in order that the new edifice might have a distinctive Christian character. The architecture of the churches of Justinian was shut out, edifices of that character being now appropriated as mosques; and other buildings such as those used by the present Greek church, were conceived to be likewise inappropriate. The Lombard style of Northern Italy also was not suitable, as partaking of the Byzantine, as well as from its heaviness of appearance. Thus the field of selection became a narrow one. The character appropriate for the edifice, was also much governed by the materials,—such as were available at Constantinople, including rich marbles,—the use of which, having regard to sunlight, would dictate flat surfaces, supplying the place of deeply-cut mouldings, which, indeed, were comparatively speaking, inadmissible. The judges, therefore, had not been surprised at the particular choice made of models.

In the course of his explanatory description, he referred to the feature of the apse and ambulatory, as not general in Italy, though one church, that of Saint Antonio, at Padua, might be named as having an apsidal termination; and with reference to the tower which the architect of the first design had shown wholly as an adjunct,—it was doubtful whether they would be allowed the use of bells in Constantinople. The professor also particularly directed attention to the ambulatory in the design, as suitable for the monuments, and carrying out the intention of a memorial; yet at the same time he spoke somewhat disparagingly of the propriety of the treatment in the second design (in which a considerable portion of blank wall under the windows is provided, with a similar intention), and which was less a church than a monumental chapel. He, however, praised highly the artistic conception exhibited in the drawings.

Expressing the pleasure which it had been to the judges to find that the first and second awards of premiums had fallen to architects who had held similar places in the Lille competition, where Messrs. Clutton and Burges gained the first premium, and Mr. Street the second, he said the committee in that case had not fairly carried out their conditions; but he hoped that here they should act with greater justice. He also hoped that those who had not gained premiums, would not find their labour valueless, but that their designs might be turned to account in the case of some other church.

This advantage, it is needless that we should remark, is not very likely to accrue. Anything that can be gained is more likely to result from a scheme talked of amongst some of the competitors, for lithographing the whole of the sets of drawings, and providing each competitor with a copy of each set. This would effect what was proposed in our pages in the case of the barrack competition, but not then carried out. Why, in that case, should not the thing still be done, or photography be called in to aid. The designs and particulars are, we suppose, lying stowed away somewhere; whilst no architect amongst the competitors on that occasion, we can discover, has been employed in any of the barrack-buildings for requirements of the line, that have been lately erected,—erected, too, as we must infer, with many of the defects of the old condemned system. As we urged on that memorable occasion, by following such a course as we have now advocated, great mutual benefit might be made to accrue from every competition. It should be especially urged in the forthcoming Government competition.*

* A correspondent suggests, that in exhibiting the designs received for the Government Offices, the Classic and the Gothic should not be mixed up together, but form two separate divisions.

MR. SYDNEY SMIRKE'S FIRST LECTURE ON ARCHITECTURE, AT THE ROYAL ACADEMY.*

By the kind permission of the council, I propose to address you, the students in architecture of the Royal Academy, on the subject of our common profession. On this occasion I occupy, for a while, the place of one who for many years has won your respect and esteem, by his thorough knowledge of our profession, and by the freedom and perspicuity with which he imparted to you that knowledge, and generally by those elevated views of the nature and mission of our art by which he invited ingenuous aspirants to join him in the path of meritorious exertion which he has trodden so successfully himself. I feel, therefore, a deep sense of the difficulties of my position, and of the disadvantage I labour under in following my distinguished friend.

Nor would I have contended against the conviction of my own comparatively limited powers, did I not entertain a belief that on this, the only subject with which I can pretend to any intimate acquaintance, by an honest and disinterested expression of opinion, I might contribute, in some slight degree, to advance the interests, and, may I add, to sustain the character of that profession to which I feel it a great honour to belong. I have, therefore, undertaken to address you on the subject of architecture, and to impart to you my experiences and the result of my reflections on some of the matters to which it is allied.

The task of a lecturer on architecture, some thirty years ago, would have been an extremely light and simple one. When dealing with the history of our art, he would have probably been content to repeat the oft-told tales of the paternity of Greek art, and of her less distinguished offspring, Roman art, and, hastening through the mists of the Middle Ages, passing by, with hurried steps and half averted looks, the forms of a period in which the types of classic ages appeared to have been well nigh lost, he would have emerged, with rekindled delight, into the daylight of Palladian art, when he seemed to breathe again the atmosphere of returning sense, reason, and taste.

Then, in dealing with the principles of our art, the lecturer would have arrayed before you the five orders; nor would he have failed, like a true disciple of Vitruvius, to point out for your admiration the matronly curls of the Ionic, the virgin delicacy of the Corinthian, and the manly dignity of the Doric; nor have forgotten the time-honoured fable of Katatechnos and his horticultural studies.

Such would have been assuredly the sum and substance of his discourse; and if, for the purpose of completing his subject, he had indulged in a passing notice of Mediæval art, it would have been probably to treat it as a transient fashion, as little to be regarded as the evanescent caprices of a modern modiste.

Great, indeed, are the changes that thirty years have effected! Our art has taken her stand upon a far wider base and a loftier platform; and from this more elevated point of view, the horizon of our art has become greatly extended: with these changes, the chiar'oscuro of her wide domain has also changed: objects hitherto lost in obscurity and neglect have been brought to light, revealing beauties hitherto unnoticed, and kindling renewed feelings of admiration, whilst a cold shade has been cast over some of those objects which once took rank among the fairest of architectural forms.

I am quite conscious of the enormously increased difficulties of the task of him who ventures, in these changed and still changing times, to treat of the principles of our art and their practical application. But, with these increased difficulties, the task acquires increased honour and a new dignity; whilst the comparative novelty of the course which lies before us awakens an interest which it would be vain for me to attempt to excite in you whilst pursuing the trite path amidst the old familiar scenes.

But other difficulties beset the path of him who, in these present times, would venture to assume the office of a teacher. We are dazzled by the excess of light that is being thrown upon

* Read on Monday evening, the 23rd inst.

our art. Expositors of art, issuing from all ranks and professions, are as numerous as our students; and such grandiose terms as "first principles," "fundamental truths," "general laws," and the like, have become almost household words. These attractive terms are caught hold of as the keys to open to our view the mysteries of the art we seek to acquire; to reveal the hidden sources of harmony, and to introduce order, symmetry, and certainty, into the domain of taste.

I am sorry that I cannot promise to feed your yearnings for truth, by announcing any such unerring criterion of taste, any such authentic formula, that shall command the approval of every observer, or satisfy the requisitions of every critic. I shall lay before you principles and systems with a very cautious parsimony. I will tell such truths only as I think I can find vouchers for, and give you such opinions as I feel well assured have their foundation in common sense; but I beg that you will not be disappointed if I do not even attempt to take wing, and plant you, *per saltum*, on the acropolis of art.

The student must be the artificer of his own fortune: the teacher may, according to his ability, arm the student with the appropriate weapons of his profession, point the way, and administer some facilities for advancement; but the art-student must expect progress only in proportion to the toil of his own hands, and the inspiration of his own genius.

The literary student has, doubtless, as wide a field to cultivate, but his labours are wholly mental; whilst the student in our department of practical science has to exercise his hands as sedulously as his head, and to make himself as intimately acquainted with the material as with the moral elements of his art. He must unite that essential constructive knowledge from which the very name of architecture is derived, with a perception of those graces of form and decoration to which architecture owes its place in the circle of academical fine arts. Our profession is peculiarly complex, and comprises obligations essentially different, nay, sometimes apparently discordant.

We have not only to conjure up a thought, and express it on paper; but we have also to make it a reality, and in that task we are liable to be embarrassed by a thousand difficulties—of cost—of construction—of deficient material—of limited and prescribed site: a weight of serious and lasting responsibility lies heavily on us; and we are not seldom sorely tried by those whose tastes we find ourselves called upon at once to submit to and to control.

Such are the difficulties which await you—which beset your path with pitfalls and with thorns. But I offer them to your notice, with no fear that they will dismay or discourage you: to a mind of energy and spirit, difficulties to be overcome tend but to strengthen the resolution and heighten the courage.

You will ever let it be present to your minds that the study of our profession is no light thing, and you will not fail to enter upon that study with a becoming earnestness and a thorough appreciation of the gravity of your vocation. I need, however, scarcely remind you, that the utmost diligence will be of little avail unless that diligence be wisely directed. That a proper direction be given to your studies is indeed absolutely and obviously essential to their future success. There must be no impatience under the restraint of rules: the mind must be disciplined and reconciled to subordination, for he who would command must first learn to obey. Our great master, Reynolds, has said, with his wonted sagacity,—"The impetuosity of youth is disgusted at the slow approaches of a regular siege, and desires, from mere impatience of labour, to take the citadel by storm: they wish to find some shorter path to excellence, and hope to obtain the reward of eminence by other means than those which the indispensable rules of art have prescribed."

We often hear "rules of art" condemned as leading to academic coldness, and to a tame, lifeless formality. True it is that no mere rules—no prescriptive teaching—can supply the want of that innate perception of grace which is not made but born, which must come uncalled for, if it comes at all; but let us by no means be led hastily to infer from thence the inutility of such rules. They will not suffice to give life to a school copy any more than they will animate a lay figure; yet sound rules of art serve to inspire the best artist with confidence, and, above all, will curb the erratic tendencies of even genius itself, ever prone to overlook the line which distinguishes the bold from the extravagant, the sublime from the ridiculous, even the right from the wrong. Let no student suppose, in whatever amount of conscious strength he may indulge, that he can with safety trust himself to the trackless wastes of his own imagination, and shut his eyes to the lights that have been set up by long experience, or to the landmarks which the *past* has left for the guidance of the *future*. It is a false and vulgar opinion that rules are the fetters of genius. "He who begins by presuming on his own sense," says Sir Joshua, "has ended his studies as soon as he has commenced them." Now, the orders of architecture are instances of such rules of art, and have been instituted, not as fetters to embarrass, but rather as helps to strengthen the judgment.

It is no uncommon thing to hear these orders spoken of with disparagement, as tending to inculcate a servile adherence to arbitrary rules, destructive of originality and of inventive talent. I think that this impression is founded on a misapprehension of the nature of these orders; a misapprehension I am ready to admit likely enough to arise from the dogmatical tone in which the proportions of the five orders are often laid down.

The truth is that the artists of ancient Greece, in its best days, endowed with an unmatched perception of beauty, and of the most refined cultivation, were led by their observation and experience to adopt certain general forms and proportions, and students, struck with their beauty, have sought to trace it back to its original sources by an analysis of those forms and proportions—that is, by their exact measurement and delineation,—a very legitimate, natural, and indeed necessary process.

In thus deducing a system of proportions from the practice of the best architects, we are surely acting as reasonably as the student who would deduce rules of poetical composition from the poetry of Milton or of Pope.

It is thus that the orders of architecture have been instituted; but it is an error to regard them as composing an infallible standard of taste from which any deviation must be heresy. With a praiseworthy adherence to truth, the travellers who have measured and delineated these works, in giving us their transcripts of ancient examples, have figured for our information minute fractions—very hairs' breadths,—and thankful we should be for their laborious exactness; but it would be a gross mistake to represent that to these fractions we are to pay a superstitious reverence: this was far from the practice or intentions of the great authorities themselves.

Vitruvius tells us of the diversity of practice that prevailed even in his own times. In truth, many wide diversities exist even among the best examples.

In the relation of the diameter to the length of the shaft of the Greek Doric order there is a difference of 33 per cent. between the heaviest and lightest examples even in the best times. In the Ionic order a similar, though perhaps not so great, diversity prevails; and every tyro is aware also of the extreme variety in the form and character of the details existing between even pure examples of these two orders. Similar comparisons might easily be multiplied, abundantly sufficient to show that the best masters of Classic times held the reins with a loose hand: indeed, under the easy sway of these five orders, we recognize a regimen so mild as to satisfy any reasonable love of liberty.

The value of these great examplars has been not unfrequently tested and proved by the fantastic variations which have been sometimes boldly grafted upon them. In these attempts at new or amended orders (some of which may, perhaps, suggest themselves to your recollection), we find little to encourage any wide departure from the parent forms, but, on the contrary, we recognise in them more clearly the convenience and wisdom of adhering pretty closely to *known standards*, which the eye has learnt to appreciate as acutely as the cultivated ear distinguishes the intervals of scientific harmony. To set at naught the architectural forms which the age of Pericles has bequeathed to us, is about as idle and undiscerning a task as to contemn the rules of counterpoint, or the musical scale which has descended to us from Guido of Arezzo.

If we turn to the other great system of architecture, that which grew up in the Mediæval period, we shall find artists still acknowledging certain general and leading principles; singularly differing, indeed, from those which guided their predecessors, but still rules of art.

It is true that, so far at least as relates to ecclesiastical structures, these rules have been influenced in a material degree by the dogmatic teaching of the Christian Church, which, if it has on the one hand inspired many very striking and sublime conceptions, so on the other hand it has imposed some restraint on the erratic tendencies of Mediæval genius.

I confess that I am unable to assign to the favourite symbolism of the early Church many of those forms and features which were in truth of earlier growth. We recognise in the Romanesque church the familiar forms of the Roman Basilica, and no ambiguous tendency to Roman architectural decoration: yet we cannot fail to see that a symbolism, grafted on pre-existing forms, which sought to appropriate, and to sanctify, the most admired features of Pagan art, did in fact gradually pervade the whole system of Christian architecture, and impressed upon it a character which departed widely from the types of ancient art.

Thus it is that architecture has ever submitted itself to a wholesome control, without opposing any impediments to the exercise of inventive genius. No art has stagnated less than our art: perpetual change has rather been the law of her existence. The student, therefore, as I have already urged, should learn to reconcile himself to the discipline of the schools, and use it as the safest foundation to receive the superstructure of his subsequent education and practice.

An important portion of his preliminary studies should be the acquisition of a comprehensive knowledge of the works of past times. A large and conscientious survey of such works exercises the judgment, forms the taste, and fertilises the mind, of the observer, and promotes the growth of new thoughts and new combinations.

Sir Joshua, with his usual felicity, says—"The student unacquainted with the attempts of former adventurers, is always apt to overrate his own abilities, to mistake the most trifling excursions for discoveries of moment, and every coast new to him for a new-found country," and "to congratulate himself on his own arrival at regions which they who have steered a better course have long since left behind them."

It may perhaps be superfluous to urge these considerations on you now, when, I fear it must be admitted, that the leaning of the present day is rather towards an excessive admiration and a somewhat undiscriminating revival of a bygone age. Of course it would be a very serious error to stop short at the acquisition of such knowledge, which should rather be regarded as the means and materials for further development, and the bases of your future operations.

Our art has been often subjected to the reproach that it has not advanced *pari passu* with other branches of human knowledge; and it is useless to deny that æsthetics have not kept pace either with physics or the exact sciences.

We must, however, bear in mind, that there are important heads of human knowledge which are not in their nature susceptible of indefinite extension, and in which it is idle to expect progressive discovery.

There is every reason to believe that the works of nature supply, and will ever supply, an inexhaustible field for the research of human ingenuity. We can hardly contemplate the time when the facts, which lie concealed beneath the surface of created beings and things, will become revealed to all mankind. The Omnipotence that made can alone fully make known the infinite wonders of his own creation. But as it certainly is in morals, so in æsthetics it

may be, that no new important principles remain to be discovered, and that we can look only for new combinations, for the employment of new materials, and for the discovery of new constructive inventions. A hasty retrospect will, I think, confirm this supposition.

Upwards of 2,000 years ago a more refined and delicate taste, and a more thorough mastery of the power of representing beauty, existed, than the world has since been able to acquire; nor was that extraordinary æsthetic development confined to a few rarely-gifted artists, for there is not wanting good ground for believing that it pervaded the general mind of the Greek people.

Again, 1,700 or 1,800 years ago, the grandeur of the Roman empire was well typified by a corresponding grandeur of architecture, which has never since been equalled.

We are compelled to acknowledge that 500 or 600 years ago workmen wrought with a freer spirit, a bolder genius, and a more genuine artistic ardour than distinguishes the workmen of the present day. We find, 1,200 years ago, in the Gregorian chants, musical compositions conceived of a grander character and deeper feeling than the music of the modern school can lay claim to. It seems to be in accordance with these general views, which I have ventured to express in extenuation of the *supposed* tardy advance attributed to our art, that a great musical composer of the present day has attempted to account for the admitted want of originality in modern musical composition, by expressing his opinion, or at least his suspicion, that all the material changes of which the notes of music are susceptible may have been already rung out. I cannot indeed adopt this theory, even in respect to music, and I am still less disposed to damp the aspirations of young *architects* by countenancing any such doctrine of exhausted originality.

I believe, indeed, that the fundamental principles of architecture leave but little room for important future discovery; but the combinations which the component materials of art permit—their variation, composition, and decoration—are practically infinite and inexhaustible.

May we not discern some relation between the progress of fine art and the corresponding development of the individual man? Our first pleasures are all sensuous: our earliest efforts are limited to the exercise and gratification of our senses. The eye and the ear are, I believe, as acutely sensitive in early youth as in the after man: it is not until the faculties of the mind are somewhat matured that it begins to discriminate; to survey nature with a more intelligent observation; to take a deeper interest, and to recognise a more pregnant meaning, a more mystericus harmony, in its forms, its sounds, and its colours.

And so it may be that, in the earliest ages of civilization, men mainly cultivated those arts which address themselves to the senses.

It seems, indeed, to be conformable with our ideas of the Divine will, to suppose that we should be instinctively supplied with the power of enjoying the pleasures arising from these simple elements, whilst purely intellectual pleasures, such as are derived from acquired knowledge and matured experience, are left to be gradually attained by the slower process of self-culture.

These inquiries, however, are scarcely fitted for the present occasion, and must not be here pursued: but the fact can hardly be disputed, that not in this country only, but elsewhere, and everywhere in our hemisphere,—whatever may be the cause, whatever the remedy—the fine arts, or at least our art, has not kept pace with time; and, I may add (although I hope that there is no inherent connexion between the two phenomena), that those countries in which, in modern times at least, political and commercial improvements have been most remarkably developed, have been perhaps the least fortunate in the cultivation of æsthetic talent.*

EXHIBITION OF THE SCOTTISH ACADEMY.—This exhibition is now in form after some delay. The *Scotsman* says it will probably not be inferior to any of its predecessors.

* To be continued.

CHURCH-BUILDING NEWS.

Norwich. — A new congregational chapel is about to be erected at Norwich. It is understood that the design of Mr. James (a son of the Rev. J. A. James, of Birmingham), has been accepted for the building.

Bury.—A painted window has been placed on the north side of the communion-table, in St. Mary's Church, Bury. The subjects of the six principal compartments are Christ's Entombment, Resurrection, and appearance to Mary; and groups representing the three Acts of Mercy—"I was in prison, and ye came unto me;" "Naked, and ye clothed me;" "Sick, and ye visited me." In the tracery of the head of the window are the figures of Moses, Aaron, Samuel, and Joshua; David, Gad, Elijah, and Solomon; surmounted by the monogram of Christ. At the foot is the inscription.

Aylsham.—At the parish church, Blickling, on removing the old window at the chancel, it was deemed advisable to erect a new gable for the reception of the present one, and to Mr. John Freeman, of Aylsham, was entrusted the rebuilding of the east end and furnishing the stonework of this window. Messrs. Hardman and Co. of Birmingham, supplied the window, which was sent to the Paris Great Exhibition, and there obtained a silver medal. The style is Decorated, divided by four mullions with a multifoil heading, in which is represented the Resurrection of our Saviour: in each division surrounding are angels, &c. The five lights are divided into two compartments, with St. Andrew and the Evangelists. In the lower the subjects are, "Bearing the Cross," "The Crucifixion," "The Dead Christ;" the two outside divisions having the armorial bearing of the Hobart and Harbord families. Underneath is the inscription.

Lee (*Kent*).—The enlargement of the Baptist chapel, together with new school-room and vestries, have just been completed and opened, the former buildings having been found too limited for so increasing a neighbourhood. Messrs. Piper and Sons were the builders, from the designs, and under the superintendence of Messrs. Bidlake and Lovatt, architects.

Exeter.—The Roman Catholic church of St. Nicholas, Exeter, which has been enlarged by the addition of a transept, 54 feet 6 inches, by 17 feet, also of an angular apse, was re-opened on 19th inst. The original building was Italian, and its sash windows have been replaced with Norman two-lights, of Bath stone. The west front, stripped of its stucco, wood cornice, and *classic* doorway, and having undergone the extinction of three circular "Christopher Wren" windows, now replaced by legitimate Norman apertures, and surmounted by a new gable, exhibits a façade of the real red stone. The flat ceiling, carried on into the transept, is ornamented with polychrome, skilfully done by Mr. Dipstall. The interior is re-seated with stained deal open benches. Mr. Morton, of Exeter, has carried out the work, Mr. Ashworth being the architect.

Westleigh.—Mr. Wilmshurst has finished and fixed a memorial window in the church at Westleigh, near Bideford, North Devon. It is a perpendicular window of three lights, and contains the figures of Faith, Hope, and Charity, beneath which are the armorial bearings of the family, and in the tracery emblematic devices. At the base of the window is an inscription, stating that it was erected to the memory of the late Jane Torr (widow), of Eastleigh, by nine surviving children, of herself and the Rev. John Torr who was thirty-two years vicar of Westleigh.

Burbage.—A memorial window has lately been erected in the church of Burbage, Wilts, to the memory of Dr. Denison, late bishop of Salisbury. The quatrefoil contains the arms of the see, and a text (Philippians ii. 29), in oblique bands, runs across the two principal lights, commemorative of the bishop's conduct when the cholera raged at Salisbury. There is a subscription on foot, it is said, for the purpose of erecting a painted east window.

Hereford.—A Bill for the restoration of Hereford Cathedral has been brought into Parliament. Having fallen into grievous dilapidation and decay, the late Dean Merewether devoted his energies for many years to procure its restoration and repair. He succeeded in raising contributions, with additions from various sources, amounting to something like 26,000*l.*; and the result was the partial restoration of the edifice. But the funds proved sadly inadequate to the contemplated purpose of a complete restoration. A sum of 15,000*l.* or 20,000*l.* more is absolutely necessary; and the Dean and Chapter have resolved to raise a loan for the requisite purpose, on the security of the Chapter property.

Birkenhead.—The congregation for some time past worshipping in the Congregational Chapel, Grange-lane, Birkenhead, are about to erect a more commodious edifice at the junction of the Woodchurch and Oxton roads. The new church will be built of white Stourton stone, and will be 100 feet long, 45 feet wide, and 60 feet high, and will accommodate 500 adults on the ground-floor, and about 100 in the gallery, provision being made for subsequent enlargement either by galleries or transepts, or both, so that, while retaining the harmony of the design, the building may be increased to twice its present capacity. There will be vestries, and a lecture-room which will seat 250 adults. It is proposed at first to erect only enough of the steeple to provide for the principal entrance at the front of the church. The estimated cost of the edifice, including the first part of the steeple and the land, comprising 1,800 square yards, is about 3,000*l.* Towards this amount about 1,700*l.* have been subscribed. The architect of the new building is Mr. N. Cole, of Birkenhead. It is expected that the foundation-stone will be laid next month.

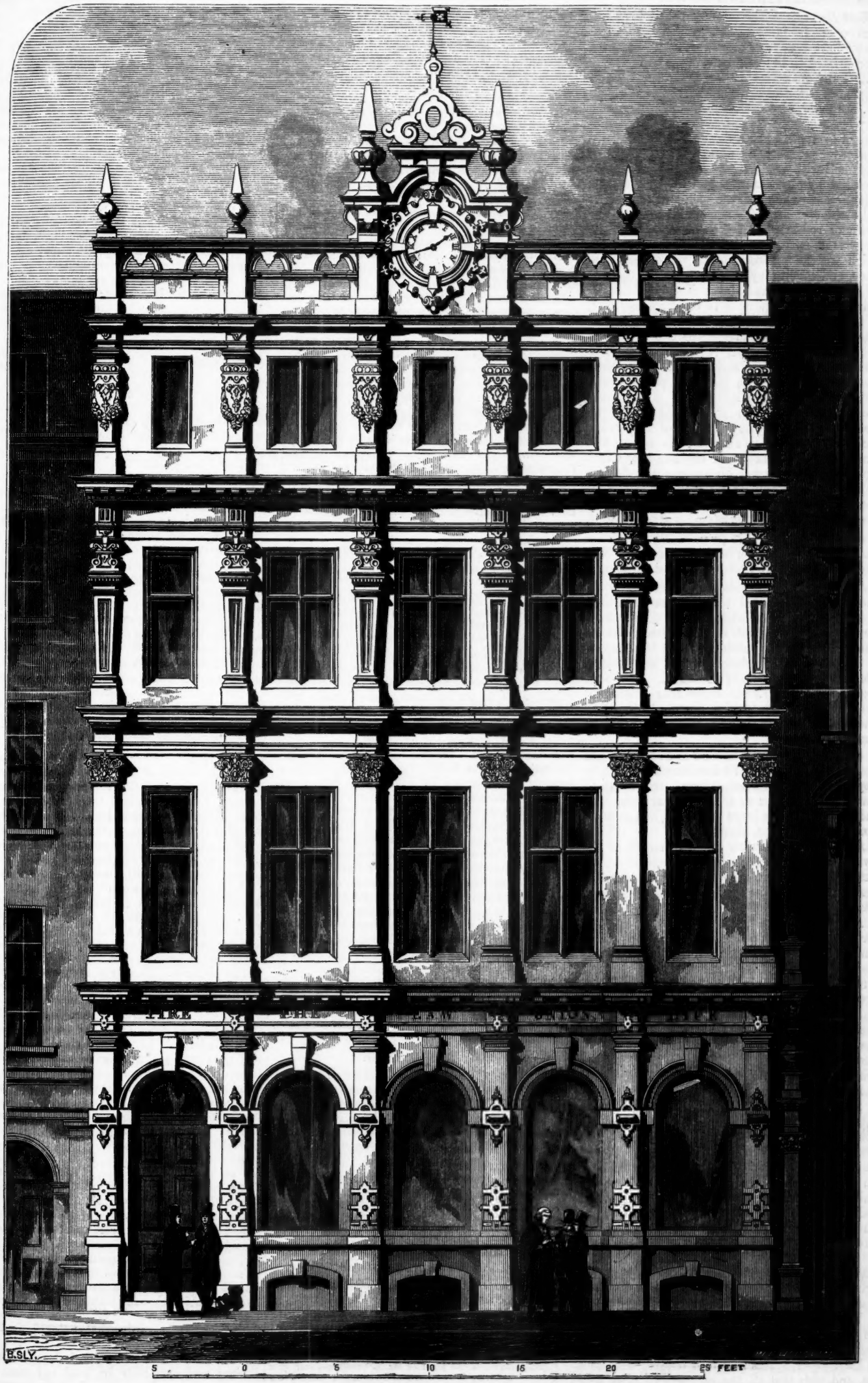
Leyland (*Preston*). — The Catholic chapel at Leyland has lately had a new sanctuary added to it. The addition comprises a large reredos consisting of three compartments of decorated Gothic work, and a large centre with two small ones, one on each side. Under the arches on each side of the altar it is intended to place large statues of St. Andrew and St. Benedict. The work has been executed by Mr. G. Swarbrick, of Preston.

THE LAW UNION INSURANCE OFFICE.

THE Law Union Fire and Life Insurance Company, which numbers, we believe, upwards of 500 members of the legal profession among its shareholders, have taken on lease from the City of London a spot of ground in Chancery-lane, within one door of Fleet-street, a locality better adapted to their peculiar requirements than the present place of business in Pall-mall. We present our readers with a view of the new offices just completed by the company. The front is entirely of stone, and Elizabethan in character, which gives an opportunity for producing attractive effect, aimed at in erections of this description, without vulgarity.

The building, though possessing a frontage of nearly 40 feet to Chancery-lane, is, owing to the narrow and inconvenient shape of the ground, somewhat cramped as to its internal accommodation, and has required study to make the most of so limited a space. The arrangements comprise, on the ground-floor, the public office and secretary's room; on the first-floor, the board-room, 28 feet by 20 feet, and 15 feet high, and ante-room; on the second-floor, securities, committee-room, and waiting-room; on the third-floor, clerks' office and housekeeper's rooms; and in the basement are placed the strong-room, porter's-room, and bed-room—cellars, clerks' lavatories, &c. The architect's estimate, exclusive of fittings and fixtures, was 2,800*l.*; and the cost, we are told, will not exceed that sum. The works have been carried out by Mr. Geo. Myers, under the superintendence of the architect, Mr. J. Wornham Penfold.

SALOPIAN SOCIETY FOR IMPROVING THE CONDITION OF THE INDUSTRIAL CLASSES. — This is a new society just established under the Limited Liability Act. Calls of 1*l.* per share only are made at regular intervals of six months, thereby allowing a period of two years and a half for the payment of a 5*l.* share.



THE LAW UNION INSURANCE OFFICES, CHANCERY-LANE.——MR. J. W. PENFOLD, ARCHITECT.

PROVINCIAL NEWS.

East Dereham.—The new corn-hall here has been opened. Old shambles and slaughter-houses have been cleared away, and the space appropriated to the new building is in the most central and open part of the town. Mr. J. B. Goggs, of Swaffham, was the architect; and Mr. Hubbard, of Dereham, the contractor. In May last the building was commenced. It consists of four walls and a flat glass roof, the principal front presenting a colonnade of Corinthian columns, with projecting cornice, and surmounted by pilasters and cornice of the same order. The whole of the columns, pilasters, and archivolts are of Ancaster stone, and the panels of red brick. A peculiar feature in the front is a space forming an entrance lobby, which will be enclosed by a pair of cast-iron gates, and covered by an arch, intended to carry the proposed base and statue of the late Earl of Leicester. This statue is to be of colossal size, in stone, and will be the work of a London sculptor. The whole area of the hall is covered in by a wrought-iron roof in one span, formed with semi-circular ribs and principals. Outside, the roof is covered with Hartley's patent rough plate-glass. A panelled ceiling of obscured glass, of which the ribs are formed by the tie-beams, is placed at the springing of the arched ribs of the roof. In summer, the ceiling will prevent the direct action of the sun's rays into the hall. The internal dimensions are 80 feet by 50 feet, and the height 27 feet from floor line to glass ceiling. The floor is of hard timber. The cost of the building has been about 1,800*l.*

Wolverhampton.—The plans of Mr. Banks for the new library building have been selected. The directors now require tenders for the building.

Bradford.—The foundation-stone of the aqueduct (under Contract F.) was laid on 10th inst. at Draughton, near Addingham. The total length of tunnelling will be 17½ miles. The contractor for the Draughton portion is Mr. Barker, of Wakefield: the sub-contractors are Messrs. Boocock and Benson, of Bradford. The sub-contractors and friends afterwards celebrated the occasion at the Sailor Hotel, Addingham. The first portion of the tunnelling was keyed on the following day.

West Hartlepool.—The new market-place has been opened. It is 470 feet long from east to west, and 138 feet 6 inches broad from north to south, and contains an area of about one acre and a half. It has large entrances, and is fitted up with small shops, sheds, &c.

Shields.—The pier on the south side of the Tyne is making perceptible progress, and already extends as an arm into the sea. A wharf is nearly finished on the south side of the Narrows, for shipping stone into lighters and small craft.

Alston.—A town hall or public building has for some time been a desideratum in this town, and a committee has been formed for the collection of subscriptions. The Commissioners of Greenwich Hospital have granted a piece of ground for a site, at the Vicarage, in the low part of the town. The building will be commenced early in the spring, and will contain savings' bank, public room, mechanics' institute, news room, &c. The subscription list has, within a few days, reached 440*l.* and the estimated cost is about 1,200*l.*

Edinburgh.—Captain Fowke, R.E. was here lately, examining into the propriety of acquiring Argyle-square as a site for the Scottish Industrial Museum, on which subject he was to report to the Board of Trade.——A new street is about to be constructed from the High-street to the railway termini, at Waverley-bridge. It is to be called by the name of the late Lord Cockburn, in commemoration of the interest which he always felt in the improvement of the city.

Montrose.—Plans of the proposed new markets have been received by the treasurer's committee from four architects,—two belonging to the town, and two residing elsewhere.

Guernsey.—The tenders for another section of the new harbour-works were opened by the committee on Tuesday before last. Report, says a local paper, states that four tenders were sent in, and adds that all the competitors were very close to each other in their estimates. One of the tenders, we hear, requires three years and four months to complete the work.

CHIMNEY CONSTRUCTION.*

Chimney construction may appear to many a very humble theme, and if we examine most of the structures erected to pass smoke and foul vapours into the atmosphere, we shall find such structures are as bald as the theme is humble. To be "as hideous as a factory chimney" has passed into a by-word, or proverb of comparison; and most certainly huge piles of brickwork, without break in line or contour—bare, bald, and grimy—cannot be said to present to the eye much to admire. For the most part, factory and other tall chimneys have one form—a vertical base finished with a plain string-course; then a uniform batter, finished at the top by a plain stone string-course, or coping. Some few tall chimneys have heavy, over-hanging cornice finishings, cramped and bound in place. Many of these are, however, lumpy and painful to sight, and dangerous to the structures.

It is not my wish to throw censure broadcast, or to recommend any suggestion now made by reviling existing structures. I rather state opinions widely entertained, namely, that factory and other tall chimneys, as now erected, cannot be considered eminent for beauty. If the question "Who is to blame?" is fully sifted, I expect the great mischief-worker "nobody" designs all the tall chimneys; for I presume it rarely enters into the mind of a cotton lord to employ an architect of known reputation to design a chimney. There are, however, exceptions, and it is to be hoped that which is now exceptional may become the rule. It will be no new thing to add design to a tall chimney. This fact may have weight with some minds. In Italy and throughout the East, towers and minarets have had the best architects of the day for their designers. They have stood for ages monuments of beauty, and have been admired by countless thousands. If "a thing of beauty is a joy for ever," then have such towers and minarets given joy incalculable.

Campaniles, watch-towers, and minarets exist as tall and as slight in sectional area as many of our tall chimneys.

In Italy and throughout the East, a bare or positively ugly chimney-shaft or group of chimneys is rarely to be seen. I do not remember to have seen such, but I saw hundreds which in design and form pleased the eye. A first vision of British chimneys, as contemplated from our railways, must, I fear, have caused many a nightmare to sensitive foreigners. Our house chimneys are for the most part brick abortions, made more frightful by pipes and cowls of pot, zinc, and iron. To be ugly is an evil; but such chimneys are not only ugly, they are also dangerous.

It has been said, "there is a time for everything." In Italy during the Middle Ages, there was a time of building tall towers. In 1159 there were about 10,000 tall towers in Pisa,† and a proportionate number had been erected in most of the principal cities of Italy. The towers of Asinelli and Garisenda, at Bologna, show how tall chimney-like they were in appearance. The Asinelli tower remains almost entire, and is 276 feet high. Mr. Gally Knight designates it "a standing monument of pride and absurdity"—an Asinelli folly. The nobles of Italy built these towers first as a means of defence, but subsequently in rivalry, as a symbol of illustrious birth. They were fashionable; and what will man not do to head a prevailing fashion? The trade requirements of modern times necessitate the building of tall chimneys; and Manchester can match the 10,000 tall towers of Pisa, as the manufacturing towns can match the other cities of Italy. I sincerely hope it may become fashionable to strive after grace and ornament. A tall chimney need not be ugly.

Mediæval Chimneys.

The chimney constructions of mediæval times are only named for the purpose of directing the attention of the student members to their beauties. Examples are to be found in castles, baronial residences, and in mansions, dating from 1400 downwards. Britton may be consulted relative to brick constructions and chimneys in the second volume of "Architectural Antiquities," page 95: engraved representations are also to be found in other well-known architectural works. Old English mansions may also be inspected, but there are many modern imitations in pot, in terra-cotta, and in cement. Few are worked out as they were worked out in the honest old times.

Tall Chimney Construction Foundations.

The foundation of any building must be the first constructive care of an architect. The foundation of a tall chimney may require extraordinary precautions. Rock will be excavated and dressed off to a level and even bed. Clay, marl, gravel, sand, or varying mixtures of these may tax all the resources of the engineer or architect. An unequal or uneven foundation, part soft and part hard, is most to be dreaded. A compressible foundation is also unsafe—that is, clay, marl, or shale, compressible by weight. Many of the oolitic and tertiary marls are compressible to considerable depths, and ought not to be trusted, however solid they may seem to be. The probability is that most of the leaning towers of Italy are founded on such strata. Some of them may stand as designed—architectural tricks—but most of the leaning towers are no doubt foundation failures.

The modern architect has at his command means and appliances of the greatest utility, which were unknown to men in former times. Steam can be brought to aid in driving timber piles, and simple applications of water or air will sink hollow iron piles with comparative ease. The old Eastern plan of forming deep wells and then filling them up with concrete has been too much neglected. Modern well-sinkers will go down in any strata almost to any depth—certainly to any depth required in practice; and a secure foundation may thus be made for the loftiest structure in the most difficult ground. Masses of concrete or of brick or stone work placed on a compressible substratum, however cramped and bound, may prove unsafe. Solidity from a considerable depth can alone be relied on.

Enlarging the area of a base or foundation by footings can be resorted to; but mere enlargement of area may not in itself be sufficient. A lofty structure which is to stand secure must have solidity sufficient to maintain each part in the position in which it is first placed.

Foundations are too frequently slighted, or labour and material are wrongly applied. The compressibility of oolitic and tertiary clays can only be overcome by piling, deep sinking, heavy ramming, or heavy weighting. The point of bearing must be carried below any possibility of upward reaction. A heavy embankment or heavy pile of building frequently disturbs the surface ground at a distance of many yards, the subsidence causing a corresponding rise around on either side, as the case may be. A tall chimney or tower of like proportions, built on such a foundation, if not made safe to a sufficient depth, would most likely become a "leaning tower," if not actually a falling tower. Probably the depth of a foundation in compressible ground ought not to be less than one-fourth the intended height above ground; that is, for a shaft of 200 feet the foundation should be made secure to a depth of 50 feet. This could easily be done by piling, or by well-sinking and concrete.

Bricks and Mortar.

The lofty towers of Italy and the minarets of the East are for the most part constructed of bricks and mortar. I have examined the bricks, and I have tested the mortar, and found that neither the one nor the other is better than, if so good as, the modern architect may have at his command. The proportion of brick to mortar in the foreign structures differs, however, most materially from modern practice.

The bricks of Italy and of the East are very thin in proportion to area of bed—9 inches square by inch, or at the most inch and a quarter, in thickness. These bricks, or (as we should almost designate them) tiles, are frequently set or bedded in mortar as thickly spread as the brick, so that there is almost as much mortar as brick. From my examination I have no hesitation in saying that the permanence of the work is in a great measure dependent on this liberal use of hard-setting, tough mortar. The tornado's sweep and the earthquake's shock have alike failed to overthrow these slender and lofty piles; though many times they must have shaken, vibrated, and bent under the furious effects of the contending elements and dread tremblings of the earth. The elasticity and tenacity of the mortar have, in my opinion, alone preserved the structures from sudden overthrow. It is a modern practice to stint the use of mortar. Specifications generally set forth that a bed of mortar shall not exceed one-eighth of an inch. It will be a new clause, but not any less useful one, if at times we specify that a bed of mortar shall not be less in thickness than half or quarter of an inch. In tall chimneys or towers the mortar should be of the best quality: it should be ground by horse or steam power, and should be used liberally.

Those who wish to ascertain the quality and power of mortar have only to visit the Liverpool docks, and inspect the works of Jesse Hartley. They will there find river and dock walls having in their composition almost as much mortar as stone, and the one as enduring as the other, although that stone is the hardest and best granite.

With thin bricks and thick beds of mortar the Italians used iron bolts for bond, and some of the Eastern minarets have poles of timber enclosed vertically in them. Timber cannot, of course, be used in tall chimneys, but hoop-iron for bond is well known to the profession, and its aid is highly desirable

* The following is the paper by Mr. R. Rawlinson, read at a meeting of the Liverpool Architectural Society, as mentioned in a previous number.

† My authority is Gally Knight. But I think there must be some mistake: 10,000 towers in one town is a large number. Upon investigation, the cat anecdote may be equalled. We know, however, there were more than two.

for many purposes. Rods or bolts of wrought iron, to give vertical tie, may be used; but all tall structures should depend on the strength, cohesion, and gravity of the materials, for stability and permanence, rather than on iron or other aids.

Tall chimneys have elements of destruction to contend with which are absent in Italian tower and Eastern minaret, namely, great heat, and gases which may affect and destroy both bricks and mortar. The only remedy against these elements will be so to design and construct the chimney as to have an inner lining of the flue, which may be cut out, taken away, and be replaced without endangering the structure. A space or air chamber betwixt the true shaft and lining will be of great service in preserving the whole.

Towers and minarets have, for the most part, internal stairs, or means of access up them. Our largest and tallest chimneys may easily have means of access provided, as also means for erecting temporary scaffolding for examination and repairs, should repairs be required. This hint will, I doubt not, be sufficient. An architect or an engineer should provide for all contingencies, and not build a tower or chimney 300 feet in height, and remove his scaffolding, without having considered the means of future examination and repairs. A recess, with step and hand-irons, and putlock holes at regular stages, properly formed for easy use, may furnish means within the shaft. Openings through the shaft may form part of the design, such openings having the character of sunk spaces, the formed space being filled in, but affording means for the removal of the filling without fracturing the main work of the shaft. All tall chimneys or towers must have proper electric conductors, secured in the best manner.

Colour and Ornament.

Colour and ornament may be used in tall chimneys: contrast of colour may be made to produce ornament. The common bricks of almost any district may be sorted so as to produce contrast in tint or tone—red, and yellow or cream colour. This tint of the bricks may be preserved and heightened by using mortar of the same tone or tint. Furnace ashes and lime will produce a dark mortar; pounded red brick or red tile mixed with lime will give a red tone to mortar; and cheap mineral colours may be added to mortar for pointing. The colour of mortar is sadly neglected, as the same white lime and sand are used for all tones of colour in bricks, and not unfrequently white putty mortar is used for jointing the reddest as well as the lightest-coloured bricks; the light-coloured work having harmony of breadth and keeping—the red brick portion being frittered and broken up by the contrast betwixt bricks and beds and joints.

If precedent may be our guide in outline it may also be a guide in the use of coloured contrast; and although the use of marbles of various colours with stone and with bricks is designated "strange and preposterous," I must confess to a leaning in favour of colour, and most strongly advocate its use where dingy monotony may be relieved. There are plenty of brick and stone fronts dreary and wearying to the imagination. The oppressive feeling produced by a red brick-built town—if I may judge by my own sensations—is one of lasting disappointment. My earliest sensations were matured in Lancaster, a clean stone-built town. My first journey was to Preston, a town of red bricks. At this distance of time I do not forget the disagreeable feelings which came over me, and which I suppose I never shall forget.

I would earnestly recommend all architectural students to study the best brick structures of England and of the continent, as also the buildings in which alternate courses of bricks, stone, or marbles are used. I would not shrink from using "white, black, red, brown," or any other colour, if monotony could be prevented, and the eye and mind gratified. The classical man may call me a Saracen if he thinks proper—I hold to the use of colour.

In advocating colour, I need scarcely say that at the same time I advocate breadth and harmony, that is, "keeping." The laws of colour must be well understood, and these laws must be attended to. As in music so in outline and in colour, the student must learn well the gamut, and attend to his thirds, fifths, and octaves, or discord will be the result of his labours,—and discords in architecture are quite as disagreeable to the feelings as discords in music.

In recommending the use of moulded and coloured bricks, as also terra-cotta, I would direct attention to the Architectural Exhibition now open in Suffolk-street, London, where specimens of these materials may be seen. The catalogue furnishes full information both as to makers' names and places of manufacture.

The time is ripe for originality of design in the use of brick, if our young architect will only grapple boldly with existing difficulties. Manufacturers may be found who will second his wishes if his plans and sketches are only practicable. They must be practicable, not only to the maker, but also to the bricklayer. Any new form of brick must work in bond, or in course, with common bricks. The dimensions of any new forms in brick or terra-cotta should also not exceed the easy manipulation of the material from the clay state to the finished and burned brick or tile; and the form in all cases should be one of strength, both before use and after it has been set in any building. The form and dimensions of a common brick are perfection: there are strength, facility of handling, and adaptability to work any useful bond. Common bricks may also be arranged to form a vast variety of ornament.

Mr. Rawlinson submitted a series of very clever designs, in illustration of his views. In his description of these, he said:—

In the designs now submitted, vertical lines are, for the most part, used where existing structures (tall chimneys), invariably batter. There is, I conceive, great beauty in a vertical line used as proposed. For precedent I must refer to Italian examples, the chaste campaniles and towers, which I would fain see more studied.

Most of the designs are for detached structures, and it is desirable that tall chimneys should stand detached on their own base. A special foundation must then be prepared, and the chimney will not depend on any building for support, nor injure or be injured by vibration, or partial settlement in the foundations, or in the materials used. The vertical form adopted almost throughout may be objected to, as offering a larger area for the wind to act upon. My reply is, the wind will not injure a sound structure standing on a good foundation. The force of the wind in our greatest storms rarely reaches 20 lb. on the square foot; the gravity of any chimney is much greater than this. Eastern minarets and Italian towers stand not only storms of wind, but also shocks of earthquake.

In no case are quoins shown, either in plinth or shaft, and their use is repudiated to the uttermost. Whatever material is used must set in course with the bricks, or must form entire courses round plinth or shaft. This rule must have no exception, but must apply from foundation to summit. An external band of stone may be backed up with brick to receive the action of fire or heat; but in such case the stone must set in bond with some exact number of courses of bricks, so that the whole may be grouted and flushed into solidity.

In arranging cornices and roofs on chimneys, it may be necessary to use iron bond and iron cramps. In such case great care must be taken so to use the metal as to run the least risk from contraction or expansion. It is practicable to combine iron with stone and brickwork so as to ensure strength and safety, but the combination must not be lightly undertaken nor carelessly made.

There should not be any cutting of bricks, if possible; but all face-work should have the fire-skin preserved.

In proposing contrast in colour by brickwork I do not contemplate the necessity of obtaining costly bricks from a distance; but for the mass of the work the common bricks of a district may be so assorted and set in mortar of the same tone of colour as to effect all the contrast required. Moulded bricks for ornamental purposes, being required in small quantities, may be obtained from a distance without adding very much to the whole cost of the work.

Thought and judgment in the design and care in the execution of any work will tell more than mere expense in ornament. To the student I must reiterate the necessity of thought. Examine all the prints and drawings of buildings you can find access to. Examine all the buildings you see with the greatest care, to understand, if possible, the meaning of the architect or builder; and, above all, never put a line on paper at random, nor because it is to represent a form taken from some other building, and the reason for which you have not thought about. There ought not to be any chance forms or chance effects, but one uniform, clear, and distinct result of thinking.

BUILDERS' BENEVOLENT INSTITUTION.

A SPECIAL meeting of the directors of this excellent charity was held on Monday, 23rd inst. for the purpose of taking into consideration the propriety of having another election of pensioners in May next; the treasurer, Mr. George Bird, in the chair. The secretary reported, that the state of the funds would not allow of more than two pensioners being added to their present number, thirty-six,—viz twenty-one males and fifteen females. At the last election, in November, 1856, there were nine unsuccessful candidates, and to which number, no doubt, more would be added in the shape of new applicants.

The committee, therefore, deeply regretting their inability to elect more, appealed to the builders generally, but more particularly to the members of the numerous trades who had not yet contributed towards the support of the Institution, to aid them at the present moment, and by their support enable them to increase the number of the pensioners, and extend the benefits of the charity. The ball, it was stated, would produce about 150*l*. On the motion of Mr. John Newson, jun. seconded by Mr. R. Richardson, it was resolved that an election of two pensioners, one male and one female, should be held at the London Tavern, on Thursday, 28th May next.

NATIONAL ART COLLECTIONS.

I READ in your last number a well-digested report from a committee of the society of architects, strongly recommending the purchase of the Soulages collection. Is it not wonderful that our Government, admitting, as it must, not only the advantages of art education with reference to the industrial welfare and the social and moral improvement of the people, but its necessity, if we are to keep pace with the progress of other nations, should yet grudge the means, especially when it is considered how very little, compared to our enormous expenditure, would satisfy all the claims of art in its widest sense? Should the purchase be declined, and a smaller sum be granted, we shall see, as at the Bernal sales, some of the most important objects carried to Paris, others fiercely contested by the indignant collectors, and perhaps a renewal of the stand-up fight between the British Museum and Marlborough House. What proportion of our national art-treasures has been supplied by collectors is shown by the statement lately made in the House of Lords, and the records of the British Museum, much as they are often disgusted by the conduct of Government and trustees. Their patriotism has been of late sorely tried by the refusal of the trustees of the British Museum to purchase for a small sum, the interesting, genuine, and English collection made by Mr. Faussett, notwithstanding the entreaties of the public; in consequence, some say, of their officers having too zealously pressed it upon them: there may be other and better reasons for their decision, which has deprived the country of more than one valuable donation. The spirited purchaser of the Faussett collection has very properly, in the title-page of the catalogue, registered the decision, the error of which is established by the text and illustrations of his beautiful volume. May it be a warning for the future.

Q. P.

PROPOSED NEW ROAD IN SOUTHWARK.

At the meeting of the Institute of Architects on the 9th, Mr. Donaldson gave a description of the streets proposed to be formed by the Metropolitan Board of Works.

With reference to Southwark, he adverted to the importance of a direct communication from the western parts of London to the Borough, the railway termini at London-bridge, &c. in order to avoid the difficulties of the route through the city. He called attention to the fact, that the existing line, on the other side of the river, of the York-road and Stamford-street, constituted the greater portion of the communication now projected by the Metropolitan Board; and that a continuation of the latter street eastwards to the Borough would complete the line. It commenced at a point north of the Town-hall, Southwark, and terminated opposite the east end of Stamford-street. This line is necessarily curved, in order to avoid, whilst closely infringing upon, the College, Almshouses, Messrs. Barclay's premises, Messrs. Potts' Vinegar Works, Hopton's Almshouses, the premises and market of the Hop Planters' Company, Messrs. Easton and Amos's Foundry, &c. The estimates for this line were as follow:—

OUTLAY.

Purchase of property	£510,549
Sewer	8,875
	£519,424

RETURN.

Sale of ground-rent	£165,300
Property re-sold, and sale of old materials	33,368
	198,758
Difference, or net cost	320,671
	£519,424

But towards this cost there were already about 90,000*l*. in the hands of the Government. Contrasted with the above plan, Mr. Donaldson described [referring to a map] the route laid down by Mr. Pennethorne in 1853, being a straight line from a point near the Lambeth side of Hungerford-bridge, which it is proposed to widen to a carriage-way, passing close to the north side of Surrey Chapel, direct to the Town-hall, in the Borough. This line it was also proposed to continue eastwards to Bermondsey, and westwards by a curved line to the Surrey foot of Westminster-bridge. The main portion of the line passed through a very inferior description of property. The estimate made by Mr. Marrable was as follows:—

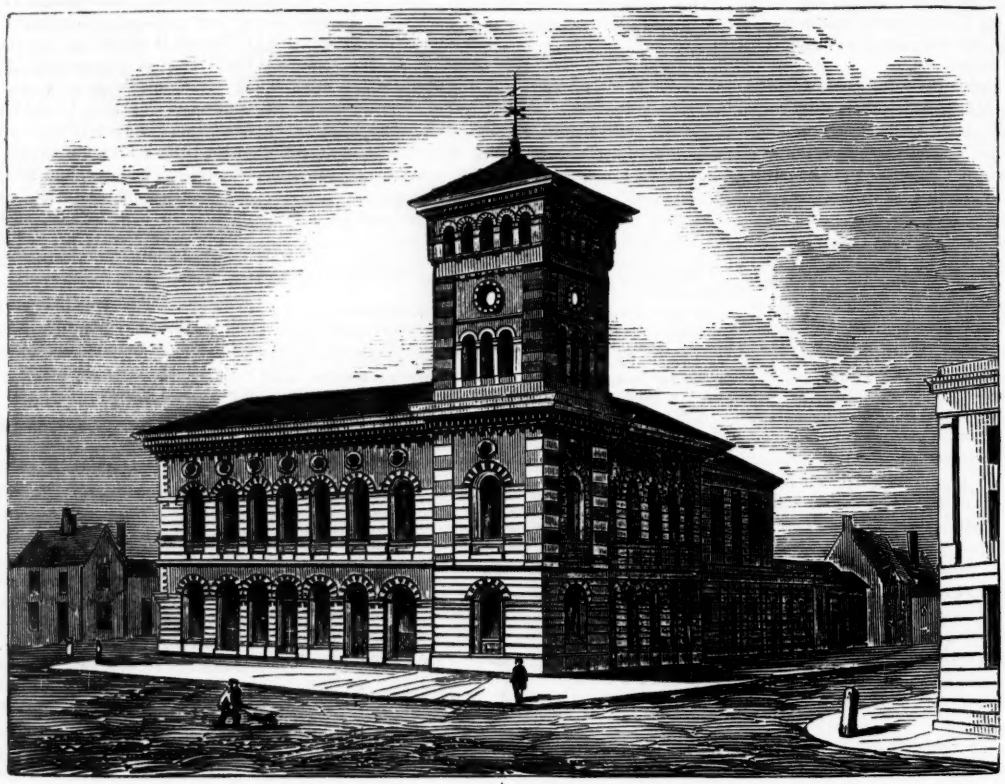
OUTLAY.

Purchase of property, good-will, and cost of sewer	£895,104

RETURN.

Property re-sold, sale of ground-rent and old materials	£631,794
Difference, or net cost	£263,310

Mr. Donaldson briefly referred to another project by Mr. Pennethorne, in 1844, for a line direct from Westminster-bridge to St. George's Church, in the Borough, on through Bermondsey, which would then be opened up to general traffic; as also to another scheme for widening the existing line of the New Cut and the streets beyond Surrey Chapel westward to the Borough, as a cheap method of meeting the required object. He concluded by impressing upon the meeting the superiority of Mr. Pennethorne's plan over that about to be submitted to Parliament, as being shorter, more economical, and as bringing into more direct play and communication Westminster, Hungerford, Waterloo, Blackfriars, and London bridges, an opinion in which we fully coincide.



Bridgnorth New Market Buildings.——Mr. Griffiths, Architect.

BRIDGNORTH NEW MARKET BUILDINGS AND HALL.

THE new market building, which is composed entirely of bricks, in colours of red, white, and blue, is in the Italian style, after a style by Mr. Griffiths, architect, of Quatford. The main block of the building is square, with a tower at the north-west angle. The markets extend down Listley-street. Being a corner building, it presents two façades, the one in Bank-street, the other in Listley-street, with the tower at the angle. The general walling is of blue brick, banded with white; the quoins, strings, and plinths being also in brick of the latter colour. The building is two storied. In the main body the ground-floor consists of shops and entrance-hall; the tops of the windows and entrances presenting, in the exterior, a line of seven circular arches, the middle three having a pier of double width on either side, thus making them central. The arches are in alternate blocks of blue and white brick, springing from piers also in blue, banded with white. The annexed rough view must be considered as simply indicating the arrangement. The base of the tower, which is divided into two compartments by the continuation round it of the string of the building, projects slightly. The compartments from the ground to the string are carried up in white brick, banded with blue, and have a window with circular arch in each of the two faces. From the string to the main cornice—which is also continued round the tower—are pilasters of white, banded with red, with a window between them corresponding with those below, but rather narrower. Above the cornice—which is continued from the main building—is a blocking of white brick, from which the tower is raised to a considerable height, with the pilasters of red and blue continued at each angle, leaving in the four faces a receding panel of blue. Each of these panels has three light circular-headed windows, with a circular opening for the clock face above them. The public hall being built over the centre of the markets, and not being so wide, leaves two side aisles in the latter, which are roofed in with rough-rolled plate-glass.

The principal entrance to the building is in Bank-street, through two archways, fitted up with ornamental iron gates, opening into an entrance-hall, the floor of which is laid with encaustic tiles of plain design. There is a central stone staircase, with cast-iron balustrades, conducting to a landing, from which are reached the various rooms above the shops. This upper story contains a reading-room and library for the new Literary and Scientific Institute, a magistrates' room, and clerks' office, and the large public hall, the latter being situate at the back, and, as already stated, over the centre of the markets. The hall is a parallelogram of 80 feet by 32 feet, and is lighted by six windows on each side.

The markets, which are at the back of the building on the ground-floor, are approached either from the principal entrance or from Listley-street. They contain fish-stalls, general and butchers' markets; the whole of which are paved with brick, fitted up with stalls, counters, &c.; and have the gas and water laid on. The general market is divided into side aisles and central avenue by piers and arches, which support the public hall.

SURVEY OF THE THAMES.

IN the leading article in the *Builder* of last week, you ask, "Can the statement be correct, that there has been no survey of the river since that of Telford?" Allow me to say that in 1852 the Navigation Committee of the Corporation of London caused a survey to be executed, extending from Battersea-bridge to Woolwich. The special object they had in view was to have an authentic record of the existing state of the river, so that future comparisons could be made, in order to ascertain the extent of the deepening of the bed of the river which is in progress from a variety of causes. This survey was executed under my direction by Mr. T. Macdougall Smith; and as the utmost attainable accuracy was required, every sounding for the longitudinal and the numerous cross sections was taken with the spirit-level; and, by a process originated I believe by Mr. Smith's assistant, Mr. May, the precise position of each sounding was observed in such a manner that it can be exactly found at any future time.

S. W. LEACH,
Engineer of the Thames Navigation and Port of London.

COMPETITIONS.

Chapel, Leeds. — Mr. William Hill, architect, Leeds, is the successful competitor for the proposed Methodist New Connection Chapel to be erected in Woodhouse-lane, Leeds, at a cost, with boundary walls and iron railing, of 3,000*l.*

Sunderland Cemetery.—In answer to advertisements offering 20*l.* for the best design for chapels, lodges, and laying out ground, forty-four sets were sent in, and from these the committee have selected a design by Mr. Matthew Thompson, architect, of Newcastle and Sunderland.

Liverpool Wellington Monument. — Will you allow me to call attention to the competition for a monument proposed to be erected in Liverpool to the Duke of Wellington? It is now rapidly approaching four months since the drawings were sent in to the committee for their consideration, and they have been *sitting upon them* sufficiently long I think to have enabled them to have hatched something out of them long ere this; but I have not yet heard of there being anything definitively come to in the matter. Three or four weeks ago an advertisement in your columns met my eye, calling for the address of "Delta X." and as I do not happen to be that individual, I made up my mind that the affair had been settled in favour of "Delta X." However that may be, I have heard nothing further of the matter since I sent in my drawings on the 1st November last.

A COMPETITOR.

Books Received.

The New Palaces of Administration. By A CAMBRIDGE MAN. Cambridge: Macmillan and Co. London: Bell and Daldy. 1857.

THE object of this pamphlet is "an earnest appeal to the competitors, the public, and the committee," in favour of Gothic, as the style to be adopted in building the proposed Government Offices. On the ground of unity and harmony, putting aside Whitehall, the Horse Guards, and the Privy Council Office (which latter, moreover, *may* come down), the writer urges, as they will be most viewed in connection with the new Houses of Parliament and Westminster Abbey, Gothic should be the style. But when so vast a pile of building is about to be erected, the very best style should be adopted irrespective of neighbourhood,—and this, with strong feeling, he declares to be Gothic:—

"If formality [he writes], tameness, method, squareness, be most beautiful, then is Italian architecture most beautiful; but if boldness, freedom, grace, if buoyant life and freshness be beautiful, then is Gothic the queen of styles. In short, if a straight line of rails be more lovely than the wild woods and the dancing sea, then is Gothic more lovely than Palladian, for the one glows with the force and spirit of nature, while the other is squared by the formal rules of man."

The appeal falls upon us rather as an echo than a voice; and, coming thus late in the day, can operate only as advocacy for those of the competitors who have adopted a Mediæval style. It is to be hoped that the judges, whoever they may be, will enter upon their task without any prejudices as to style, and, with the conviction that "whate'er is best administered is best," look for those who have best expressed the best thoughts.

Miscellanea.

SOCIETY OF ARTS: STREET TRAM AND RAIL WAYS.—At the meeting of the Society of Arts on the 11th inst. Mr. W. Bridges Adams read a paper on a subject which we have frequently treated of,—namely, "On the Application of Rails for Horse Transit in the Streets and Environs of London, and also for Railway Branches." The paper was illustrated by diagrams; and a discussion ensued. Some idea of Mr. Adams's mode of treating the subject may be gathered from his reply to the observations advanced in course of the discussion, and which we quote from the report of the whole in the *Journal of the Society of Arts*. Mr. Adams said, "It had never been contemplated by him to cover all London at once with this system of railways—nor did he think it practicable to introduce them into narrow thoroughfares, although perfectly practicable in some localities. He thought, as regarded the traffic of London, they would ultimately have to make streets on the first floor—the first floor for the light traffic, and the lower level for the heavy traffic. With regard to the railway itself, he looked upon it only as another mode of paving, and a strip of iron rail passing down a street would occasion no more obstruction than the iron gutters through the pavement to carry off the water from the houses. With regard to the rails, there was no occasion for a deep channel—a very small one would suffice to keep the wheels in their place. He believed the plan needed only to be seen in operation to be appreciated, and his object in the present paper was to draw attention to the subject. He thought it desirable that it should be tried over a short distance, and when proved to be practicable there would be no difficulty in following it up. He saw no reason why the experiment should not be tried in such thoroughfares as Oxford-street or Holborn. With regard to stopping the carriages at any required moment, there was no difficulty in adopting mechanical appliances to effect that object. He thought the rails ought to be laid upon the simplest plan, so that a length requiring to be replaced could be removed with facility. He thought the cost of repairs would be small. The load upon the rails would be so much less than that on ordinary railways, that the abrasion of the rails would be very slight indeed."

THE ARCHITECTURAL INSTITUTE OF SCOTLAND.—At a meeting of this Institute, held last week, Mr. Charles G. Reid, W.S. read a paper on "Primeval Architecture and its Remains"—Mr. Cousin, architect, in the chair. The lecturer said it could not fail to have occurred to men's minds, pondering upon the Antediluvian period, to consider under what a totally different economy to ours men then lived, breathed, and acted. His opinion was, that the people of that age had reached an infinitely higher degree of progress in science, mental and natural philosophy, and particularly mechanics, than now-a-days commonly entered into the imagination of most who had written on this subject. If this was so, on what possible ground could it be assumed, as it had often been assumed, that the first great diluvian patriarch and his family had lost all recollection of and acquaintance with the knowledge and accumulated experience previously acquired by himself, his family, and his compeers? Was it to be supposed that all knowledge and skill possessed by the antediluvian world had perished in the Flood? This, in his opinion, was impossible. They must, therefore, fairly conclude that when the ark rested upon the mountains of Armenia, Noah and his family descended into the plain fully equipped and provided for the accomplishment of the great mission intrusted to them, and that they did not enter upon that mission as barbarous savages beginning the work of civilization. Their great work would be to revive and embellish and to improve the ruins of those cities and mechanical works which the Deluge had thrown down. They had thus the means of accounting for some of the loftiest specimens of architecture, and the marks of advanced civilization discovered in ancient cities disentombed by the moderns.

COLOURED WASHES FOR OUTSIDE WALLS.—A correspondent, signing himself "Cæsariensis," says,—"As a Member of the 'Jersey Working Men's Association,' which takes in your excellent publication, I would feel greatly obliged to you to give the name of any firm or manufacturer of any liquid (if there be any), which, being applied to outside walls in the manner of an ordinary wash, has the power to stain them *permanently* of any desired tint." No such name occurs to us at present; but we may refer our correspondent to the description, by Mr. Wentworth Scott, of his "lacboracic paint," more than once given in our pages. Might not soluble silicate of soda form a basis of coloured stains? An old chymical author, who seems to know what he is writing about, states that this silicate "extracts colours from all minerals." How this is done he does not say, but the hint may suffice for new experiments.

UPWARDS OF 150 LIVES LOST BY A PIT EXPLOSION.—At Lund-hill colliery, near Barnsley, on Thursday in last week, a dreadful explosion took place, while nearly 200 persons were in the pit. After the explosion the pit took fire, and burning masses were projected even then 20 yards above the pit mouth. Measures were taken to subdue the fire, but it was anticipated that it would be some days before the pit could be entered. Sixteen persons had been brought up alive, but some of them seriously injured, and about a dozen dead bodies were picked up in the tramways; but as to the fate of the remainder, there is but too much reason to fear the worst. The pit, it is said, was considered one of the best ventilated in the district, and had just been pronounced perfectly safe before the poor miners had descended.

LIVERPOOL LABOURERS' DWELLINGS SOCIETY.—At a general meeting of the shareholders held last week, a report of the progress of this society was read by the secretary. It stated that the company's buildings in Northumberland-street had been nearly completed, from the plans by Mr. Williams, the architect. The total amount of subscribed capital, including the forfeiture of 17*l.* on shares conditionally relinquished, was 20,970*l.* Of this amount the sum of 8,340*l.* had been paid up: 5,335*l.* had been paid on account of the buildings in Northumberland-street, leaving about 1,000*l.* still to be paid. The Chairman stated that of the forty houses of the society, nineteen were already let. He had had an application from Hull, and from Salford, asking for plans and information as to the mode of conducting such a society. The report was unanimously adopted.

LIVERPOOL ARCHITECTURAL SOCIETY.—At a meeting, on the 18th, a copy of the protests from the London "Architectural Association," in the case of the Museum and Middlesex Schools competitions, and a suggestion that the Liverpool Society should interfere, was received. According to the local papers, some discussion took place, in the course of which Mr. Picton said, in reference to the letter so far as it alluded to the Liverpool competition, that it proceeded on two assumptions, both of which were incorrect. The assumptions were, that the rewarded design was being carried out, and that the committee of the Liverpool Free Library had the control over it. That design was not being carried out, but another plan had been adopted which would make the building much less expensive. It had been selected by Mr. Brown, and was under his control. On the motion of Mr. Horner, it was agreed that the communication be acknowledged with thanks, and that the Architectural Association be informed that, after a full discussion of the question, the society, under all the circumstances of the case, did not feel it desirable to interfere in either of the matters alluded to. A paper, by Mr. Leeds, entitled "Modernism or Mediævalism," was read.

MODELLING CLASSES AT BIRMINGHAM.—In your notice concerning the Birmingham School of Art, published in the last impression of your journal, you have reported certain remarks delivered by Lord Ward at the late annual meeting relative to the master of the modelling classes in that institution. As a president may reasonably be supposed to speak the sentiments of a committee of whom he is the head, and as, therefore, the speech of Lord Ward, by the wide circulation which it will now obtain, is calculated to do me serious injury, I trust you will be good enough to spare me space in your columns for the insertion of this letter. Some time previous to the annual meeting I had tendered my resignation, but it has since, notwithstanding the president's speech, been unanimously voted by the committee, that it is highly desirable to retain my services in their school. The following extracts are from the principal local papers. [We need give only one]:—"At the public meeting remarks were made deprecatory of the modelling class and its tutor. From an inspection of the specimens exhibited, and considering that the class was only revived nine months ago, after becoming almost extinct, we are bound to say that considerable credit is reflected upon the master, Mr. ——, who, whatever may be his youth and inexperience, unmistakeably knows his work." The subjoined is an extract from a report of the public lecture delivered by Mr. Wallis, art superintendent of the district. Speaking of Lord Ward's speech, he remarked,—"If he had heard what was said, he should most certainly have defended Mr. ——, for, as far as he was concerned (and he believed he spoke also for the pupils of the modelling class), he was well satisfied with the result of the seven months' work. * * * Although the specimens exhibited did not display that high perfection which some people seemed to expect in a class recently established in a school of art, still there was that in the work which plainly testified that the teacher knew what he was about."

THE MASTER OF THE MODELLING CLASSES,
BIRMINGHAM SCHOOL OF ART.

IRELAND.—A large ragged school-house has been recently built at New Combe, according to the *Dublin Newsletter*, and was opened last week. It is of stone. Mr. Maguire supplied the design, and Mr. Bolton erected the building, on a contract for 1,070*l.* of which 670*l.* have been realised by subscription.——Steps are being taken, according to the *Belfast Newsletter*, for the erection of a public hall at Belfast, capable of holding 1,500 to 2,000 persons, the want of such a building being much felt.——For the new town-hall of Coleraine, according to the local *Chronicle*, four tenders were received, two from townsmen, Mr. S. Kirkpatrick and Mr. James H. Coyle; one from a Derry man; and the fourth from Messrs. M'Laughlin and Harvey, of Belfast. After a careful examination of the tenders, it was found that the two latter were nearly equal, and on a division of the Board of local Commissioners, Messrs. M'Laughlin and Harvey were declared the successful contractors at 3,021*l.*

THE DEMAND FOR LABOUR IN AUSTRALIA, AND THE SUPPLY IN ENGLAND.—Mr. William Howitt urges, in the *Times*, that Government ought to be asked the plain question,—"Are there not funds in your hands to send out the labour so called for in Australia? And if so, why are these starving bricklayers, masons, plasterers, &c. who are so greatly needed, not sent out?" The fact is that the proceeds of the sales of lands in Australia are appropriated (or profess to be so) to this very purpose. The public ought to be informed, therefore, where the hitch is which prevents the demand in Australia from being immediately met by the surplus supply in England, whether it be a mere "circumlocution" hitch, or one of a more onerous description. "With this want of labour here and this pressing demand for it there,—with starvation on this side of the water and 10*s.* a-day for even working on the roads there, with all kinds of workmen connected with building out of work here, and there offered 14*s.* and 15*s.* a-day, what is the reason," Mr. Howitt asks, "that our destitute men and women cannot get to this land of promise—from this purgatory and destitution to that paradise of labour? There are abundant funds provided for this very purpose." Meantime there is another sort of "circumlocution" at work, as a hindrance to this great good to our unemployed, besides that of Government. It does not suit the purpose of certain political demagogues that the starving population should obtain employment: they are therefore busy in the endeavour to persuade them, by all sorts of circumlocutory arguments, not to emigrate: the unemployed, however, appear to be awake to the real motives at work with such advisers, and have treated them with the contempt which a total disregard of the best interests of the unemployed deserves.

TUNSTALL NEW MARKET HALL.—I shall feel much obliged if you will favour me with a short space in your columns, to state as briefly as possible what I consider to be most unfair conduct on the part of the contractor for the above works. In compliance with an advertisement which appeared in your paper, I sent in a tender to the Local Board of Health at Tunstall, for the ironwork required in the erection of a new market-hall, which I undertook to supply and fix for 1,750*l.* At the request of Mr. Chapman, of Newcastle, the contractor for the building, I also sent him an estimate of the same amount for the iron-founders' work; and on learning, through your paper, that the Board had accepted his tender for the ironwork, which was the same amount as my own, I, of course, supposed that he had made use of my estimate, and that he would give me the job. His reply, however, was, that he intended to reserve the *wrought*-iron work to himself, and that my price for the *cast*-iron work was too high. Feeling strongly the unfairness of such treatment, and believing that all was not straightforward and above-board, I wrote to the clerk of the Local Board on the subject, who said,—

"In reply to your letter of the 14th instant, I beg to inform you that Mr. Chapman's original tender was 1,800*l.* for ironwork. It was accompanied by a letter addressed to the architect, dated January 14, 1857, in which Mr. C. says,—'In consequence of an offer which I have only this morning received, I am enabled to reduce the amount of my tender for the ironwork contract to the Tunstall market, by the sum of fifty pounds.'"

You will observe that Mr. Chapman's original tender to the Board was 50*l.* above mine, and that he addressed a letter to the architect, offering to reduce it 50*l.*; thereby bringing it precisely to the same amount as mine. It is for you and the public to judge whether Mr. Chapman has acted fairly in throwing me overboard, after having obtained the contract through the medium of my tender. For my part I think the Board ought not, in fairness to the parties tendering, to have taken cognizance of a private letter sent to the architect, but should have decided upon the estimates sent in to them upon their printed forms, and in compliance with their public advertisement.

Derby. JAMES HAYWOOD, Jun.

THE IMPROVEMENTS AT COVENT-GARDEN AND IN SOUTHWARK.—The City authorities are preparing to petition Parliament against the Metropolitan New Streets and Improvements Bill of the Metropolitan Board of Works. The City Improvement Committee, in their report to the Court of Common Council, recommend "that the Metropolitan Board of Works should be restricted in any charge to be made upon the surplus of the London-bridge Approaches Fund to the sum which is actually required for the purposes of the improvement," and state that, "by direction of your committee, Mr. Remembrancer has been in communication with the promoters of the Bill, to fix the sum to be charged upon the surplus of the London-bridge Approaches Fund at 30,000*l.* the amount required for the Covent-garden improvement; but they have not agreed to the reasonable request of your committee, and we have therefore directed Mr. Remembrancer to prepare the draft of a petition against the said Bill, which we recommend to your hon. court for adoption." Deputy Bower, in moving that the report be agreed to, and a petition presented, said he trusted that the Legislature would protect the corporation from so serious an attack upon their finances; and he believed that if the present opportunity were not taken to appeal against the contemplated injury, there would be a rapid succession of inroads, which it would be extremely difficult to resist. The report was unanimously agreed to, and a petition, founded upon it, was ordered to be presented to the House of Commons forthwith.

THE TELEGRAPH IN CANADA.—The Montreal Telegraph Company, according to the *Canadian News*, employ 326 persons, and have 2,783 miles of telegraph line in actual operation, and 148 more in course of erection. The main line is 1,100 miles in length, and there is an independent line of 660 miles, extending from Quebec to Buffalo. Lateral lines are thrown out to the extent of 1,019 miles, and there are now 4 miles of submarine telegraph. In 1856, 500,000 messages were sent over the wires. The capital of the company is 70,000*l.* currency. The stock stands at 15 per cent. premium. It has paid, besides bonuses, a dividend of 10 per cent. per annum while constantly engaged in the construction of new lines.

BISHOP BURTON.—A monument, the principal feature of which is a shrouded female figure, was erected about 200 years since by the Gee family, in the Bishop Burton Church. This monument had gradually fallen into decay, and had been laid in a vault during the last forty years. The vicar having discovered the monument, has, with the aid of descendants of the Gee family, been enabled to restore the monument, and replace it in the church. The figure is the only part which was capable of restoration: this has been placed on an altar-tomb, the design of which is taken from one in Beverley Minster, called the Sisters' Tomb, and the old inscriptions have been re-cut on the tomb in Old English characters. The tomb has been erected, and the figure restored, by Mr. Jacolino Wilkin, of Beverley.

COMPENSATION TO RAILWAY TRAVELLERS.—The sum expended during the last six months by the Eastern Counties Railway Company in "compensation for injuries to passengers, and costs incident thereto," was 547*l.* 2*s.* 9*d.* In the previous half-year the amount expended under this head was upwards of 9,000*l.*—T.

THE DOWNHAM MARKET "COMMERCIAL HALL."—An architect, in a not very flattering account of this building and its designer, informs us that it has appended to it a heavy "balustrade in burnt clay made to resemble stone," which "runs along the front, returns along part of both ends," and is "tied up with ropes to keep it from falling!"

ROADS IN ISLINGTON.—Unfortunately the Paddington vestry is not the only one which neglects or refuses to do its duty. I have been a house-occupier and owner in Charles-street, Islington, approaching two years, and cannot get the vestry to put it into a decent state. The whole of the owners of the houses composing the street are willing to bear their fair share of the expense of having it properly made, but the owners of the houses at the corners of the street neglecting to pay their quota, the vestry refuse to proceed against them for it, shielding or excusing themselves by the statement that the Act of Parliament gives them no power to compel payment of the amount from the owners of the four houses alluded to. I have read with some attention the Act of Parliament, and consider the vestry have, by the 105th, 215th, 216th, 217th, 218th, 221st, 225th, and other clauses, abundant *power*, but they apparently do not possess the *will*. I may say that from Mr. Pratt, the surveyor, and Mr. Layton, the vestry-clerk, I have always received very courteous attention; but the vestrymen will not move, though we have memorialised them several times.

H. J. PHILLIPS.

ARCHITECTS' COMMISSION.—On the subject of architects' commission, which is occupying so much attention just now, unless a very determined stand is made against the growing system of *reduced* commission, the rule will soon be to "get what you can." I believe that architects themselves are more to blame than committees. It is now not uncommon for architects to voluntarily offer to take work at reduced commission, even as low as 2½ per cent. sooner than lose the job. Something should be done. What can be more vexing than for a struggling but honourable architect, who deems it wrong to take less than 5 per cent. to see others carry off almost every matter, because they will take the work for less?—AN ARCHITECT.

CAPTAIN SCOTT'S IMPROVED CEMENT.—Captain H. Y. D. Scott, of the Royal Engineers, has patented a method of preparing, from common quicklime, a substance which, when ground to powder and made up with water, will, it is said, set somewhat after the manner of Portland cement, and gradually attain a very great degree of hardness, thus differing essentially in its action from the preparation of lime as ordinarily used. According to the *Mechanics' Magazine*, he takes quicklime, and reverberates it in a kiln: iron pots containing ignited sulphur are then introduced, and an equable distribution of the sulphurous acid generated is obtained when the lime is placed on perforated horizontal floors. The lime may be used in lumps of the size of a cocoa-nut; and, in a properly-constructed dry kiln, one pound of sulphur is a fair allowance for each bushel of lime operated on.

DRAINAGE, NORWICH.—Extensive sewage works are contemplated in Norwich, and the question was discussed on Tuesday afternoon in the Local Board of Health. The cost of the works is estimated at 8,000*l.* A lengthy report by Mr. G. Donaldson, C.E. was read to the Board.

SOLUTION OF QUARTZ, PETREFACTION OF WOOD, &c.—Count Dembinski, in allusion to his mode of dissolving quartz by help of carbonate of soda, for the more easy extraction of gold from the quartz, says,—one of the products obtained is silicic acid, which, besides a variety of industrial purposes, can be employed in silicatising or petrifying wood artificially. Wood having by means of hydraulic pressure been saturated by it, is thus protected from rot, and from being worm-eaten or destroyed by ants. Wood, simply wetted with dissolved silicic acid, is penetrated by it to the depth of about one-eighth of an inch, and will now take a fine polish of marble or rather agate. Mixed with lime, the dissolved silicic acid forms an extremely hard, insoluble, hydraulic cement. In solution, the silicic acid is most readily reducible to silicium—a metal perfectly similar to silver in colour, brightness, malleability, and other qualities. It is, however, nobler than silver, because, except by fluorhydric acid, it is, like gold, not attacked by acids: the price is at present five times that of silver. When calcined and used as a powder, silex, or silicic acid, forms, mixed with oil, a perfectly white and opaque varnish; and for grinding the same acid is capable of entirely superseding emery.

CAST STEEL.—Messrs. J. Jackson and Son, of St. Seurin, France (through Mr. Johnson), have patented an improved system or mode of treating metal for effecting the production of cast-steel at an extremely low price; also a peculiar construction and arrangement of furnaces employed in the process of manufacturing cast-steel. According to this invention, the hammering, rolling, and working of the metal, subsequent to its withdrawal from the puddling furnace, and the several re-heatings attendant on such operations, are entirely dispensed with. The metal, after having been decarburised in the puddling furnace, is either conveyed direct to the fusing crucibles, whereby a saving of time is effected, or it is plunged into a tank or running stream of cold water. In the latter case, the metal, after being thus suddenly cooled, is reduced to powder or grains by hammers or stampers, and is then put into the fusing crucibles.

OFFICE TABLET.—Experiencing at times, on calling at offices in the City, a difficulty in being unable to leave my name, or know when the party with whom I have business may return, it has occurred to me that the following plan would be appreciated, as a beneficial saving of time and disappointment, viz.—Let there be inserted in the munting, or panel of the door, a piece of white porcelain, or other slate, with a lead pencil attached, engraved on the top thus: "Return * | * o'clock." "Please leave names." The two spaces marked * to receive the time of the intended return, by twelve figures, showing the hours, and five figures, the decimal parts of the hour, thereby preventing waste of time in ringing bells and inquiring of housekeepers, who, nine cases out of ten, cannot give the necessary information. It being let into the door would prevent the same being stolen; and now that many offices are being built and altered, I think it might be very advantageously used.

WHITE PORCELAIN.

SOCIETY OF ARTS.—On Saturday, the 21st, a *conversazione* was held in the rooms of the Institution, in the Adelphi. The attendance was very numerous (too much so, indeed, for comfort), and the tables and walls were covered with interesting specimens of art and industry.

ODD!—The enclosed, from the *Derby Reporter* of 20th inst. is somewhat too good to be lost, so I send it you, as a novel application of Gothic.—T. D. B.

"On sale by private contract, and to be removed within one week hence, a beautiful Chinese summer-house, with Gothic windows.—Apply * * * "

TENDERS

For flagging, for the Luton Local Board of Health Mr. T. L. Evans, C.E. surveyor:—

Akroyd and Co. London	£5,708 10 0
Ennor, London	5,370 0 0
Styles, London	5,117 0 3
Thornton, Brothers, Bradford	5,062 10 0
Binns, Brothers, Lincoln	5,001 9 11
Forrester, Stockport	4,985 0 8½
Peck, Luton	4,946 17 0
Jackson, Bradford	4,942 12 0
Clark, Burton	4,921 11 9
Wood and Co. Bradford	4,909 0 0
Wright and Peel, Bradford	4,883 15 0
Skelton, Halifax	4,378 10 0½
Pratt, Halifax	4,714 18 1
Malcott, London	4,696 10 0
Aspinall, London	4,673 12 7
Walker, Northampton	4,589 13 4
Green, Oxford	4,589 0 0
Tilney, Leeds	4,266 15 0
Haselgrove, Luton (accepted)	4,165 0 0
Beavers, London	3,997 0 0
Surveyor's estimate	£4,992 18 0

Mr. Beaver's schedule of prices for the measured work was higher than Mr. Haselgrove's.

For the Hastings Drainage Division B and C. Mr. J. Laing, C.E. town surveyor, who supplied the quantities:—

Rodney and Docwra, Waltham-cross	£11,997 3 8
Pickering, London	10,353 1 1
Murray, Woolwich	10,000 0 0
Moxon, Dover	9,997 15 2
Munday, London	9,928 0 0
Labour, London	9,798 0 0
Phillips, London	9,790 0 0
Howell, Hastings	8,548 0 0
Hughes and Hunter, Hastings	7,787 0 0
Bennett & Holdsworth, London	7,346 0 0

For building house and offices at Sunbury, Middlesex, for Mr. W. T. Collins. Mr. H. Walker, architect:—

J. Dove, Sunbury	£1,775 0 0
Dove, Brothers, Islington	1,737 0 0
J. Taylor, Sunbury	1,657 0 0

For rebuilding wing at the South Metropolitan District Schools, at Sutton. Mr. Nash, architect:—

Seagrave and Co.	£6,849 0 0
Thompson	6,260 0 0
Colls and Co.	6,250 0 0
Smith	6,250 0 0
Tarrant	6,000 0 0
Trollope	5,995 0 0
Nicholson and Sons.	5,975 0 0
Ryder	5,975 0 0
Marsdon	5,920 0 0
Taylor and Buckley	5,896 0 0
Aviss and Sons	5,818 0 0
Burton	5,783 0 0
Downs	5,696 0 0
Perry (accepted)	5,575 0 0

For additions to the Queen's Hotel, Norwood. Mr. F. Pouget, architect:—

Ashby and Sons	£1,773 0 0
Lawrence and Sons.	1,664 0 0
Holland	1,625 0 0
Mansfield and Son	1,570 0 0
Perry	1,557 0 0
Downs	1,516 0 0

For the erection of Banbury Corn Exchange. Mr. Wm Hill, architect:—

Hope, Oxford	£2,478 0 0
Chesterman, Abingdon	2,345 0 0
Davies and Son, Banbury	1,967 0 0
Orchard, Banbury	1,990 0 0
Kimberley, Banbury (accepted)	1,898 0 0
Throp and Pounder, for carving (accepted)	135 0 0

TO CORRESPONDENTS.

"*Liquid Glue.*"—"G. P." is referred to a receipt for making liquid glue, in an article titled "Liquid Glue—Shell Lac," in last year's *Builder*, p. 614.

"J. S. H."—"Practical Problems" (will appear).—"J. H."—"R."—"Lady B."—"A Hard-working Man."—"W. A."—"Wm S." (Eyre and Spottiswoode, the Queen's printers).—"A. G. H."—"W. H." (we cannot speak without evidence).—"E. W."—"S. M. E."—"J. W." (not desirable: thanks).—"G. L. H." (the evidence varies according probably to the nature of the water. Why not use *iron* pipe?)—"J. C. and Co." (we are forced, uniformly, to decline).—"W."—"Cambridge."—"Shop Foreman, A." (if engaged by the week, three months' notice could not be enforced).—"S. S."—"J. P."—"J. W. H."—"C. F."—"J. T." (from the surface of the ground).—"P. L. C."—"B. G."—"W. H. G."—"Messrs. G."—"A. A."—"T. B. (next week).—"W. H. T."

Books.—Notices of various books received are in type.

"*Books and Addresses.*"—We are forced to decline pointing out books or finding addresses.

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